

# Service Manual

**PIONEER**  
The Art of Entertainment

• KEH-M650/US



ORDER NO.  
**CRT1380**

MULTI-CD CONTROL FM/AM TUNER DECK AMPLIFIER

# KEH-M650

US

# KEH-M8200

US

# KEH-M8250

CA, ES

## Note:

- See the service manual CX-175 (CRT1276) for the cassette mechanism description.
- Dolby noise reduction manufactured under license from Dolby Laboratories Licensing Corporation. "Dolby" and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.

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**PIONEER ELECTRONIC CORPORATION** 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan  
**PIONEER ELECTRONICS SERVICE INC.** P.O. Box 1760, Long Beach, California 90801 U.S.A.  
**PIONEER ELECTRONICS OF CANADA, INC.** 505 Cochrane Drive, Markham, Ontario L3R 8E3 Canada  
**PIONEER ELECTRONIC [EUROPE] N.V.** Keetberglaan 1, 9120 Beveren, Belgium  
**PIONEER ELECTRONICS AUSTRALIA PTY. LTD.** 178-184 Boundary Road, Braeside, Victoria 3195, Australia TEL: [03] 580-9911  
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## SAFETY INFORMATION

### CAUTION

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual. Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

### WARNING

Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health & Safety Code, Section 25249.5). When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with the solder. Also, when soldering do not inhale any smoke or fumes produced.

## SPECIFICATIONS

<b>General</b>	
Power source	14.4 V DC (10.8 – 15.6 V allowable)
Grounding system	Negative type
Max. current consumption	7.5 A
Dimensions (chassis)	178(W) × 50(H) × 150(D) mm [7(W) × 2(H) × 5-7/8(D) in.]
(nose)	188(W) × 58(H) × 18(D) mm [7-3/8(W) × 2-1/4(H) × 3/4(D) in.]
Weight	1.6 kg (3.5 lbs.)

### Amplifier (KEH-M650/US, KEH-M8200/US, KEH-M8250/CA)

Continuous power output is 10 W per channel min. into 4 ohms, both channels driven 50 to 15,000 Hz with no more than 5% THD.	
Maximum power output	25 W × 2/15 W × 4 (EIAJ)
Load impedance	4 Ω (4 – 8 Ω allowable)
Preout output level/impedance	500 mV/1 kΩ
Tone controls (bass)	±10 dB (100 Hz)
(middle)	±10 dB (1 kHz)
(treble)	±10 dB (10 kHz)
Loudness contour	+10 dB (100 Hz), +7 dB (10 kHz) (volume: -30 dB)

### Amplifier (KEH-M8250/ES)

Maximum power output	25W × 2/15W × 4 (EIAJ)
Continuous power output	11W × 2 (1% dist. at 1kHz)
Continuous power output is 10W per channel min. into 4 ohms, both channels driven 50 to 15,000Hz with no more than 5% THD.	
Load impedance	4 Ω (4 – 8 Ω allowable)
Max. output level/output impedance (pre out)	500mV/1k Ω
Tone controls (bass)	± 10dB (100Hz)
(middle)	± 10dB (1kHz)
(treble)	± 10dB (10kHz)
Loudness contour	+ 10dB (100Hz), + 7dB (10kHz) (volume: - 30dB)

### Tape player (KEH-M650/US, KEH-M8250/CA)

Tape	Compact cassette tape (C-30 – C-90)
Tape speed	4.76cm/sec. (+ 0.14cm/sec. – 0.05cm/sec.)
Fast forward/rewind time	Approx. 100sec. for C-60
Wow & flutter	0.08 % (WRMS)
Frequency response	Metal: 30 – 22,000Hz (± 3dB)
Stereo separation	45dB
Signal-to-noise ratio	Metal: Dolby C NR IN: 71dB (IHF-A network) Dolby B NR IN: 65dB (IHF-A network) Dolby NR OUT: 57dB (IHF-A network)

### Tape player (KEH-M8200/US)

Tape	Compact cassette tape (C-30 – C-90)
Tape speed	4.76cm/sec. (+ 0.14cm/sec. – 0.05cm/sec.)
Fast forward/rewind time	Approx. 100sec. for C-60
Wow & flutter	0.08 % (WRMS)
Frequency response	Metal: 30 – 19,000Hz (± 3dB)
Stereo separation	45dB
Signal-to-noise ratio	Metal: Dolby C NR IN: 71dB (IHF-A network) Dolby B NR IN: 65dB (IHF-A network) Dolby NR OUT: 57dB (IHF-A network)

### Tape player (KEH-M8250/ES)

Tape	Compact cassette tape (C-30 – C-90)
Tape speed	4.76cm/sec. (+ 0.14cm/sec. – 0.05cm/sec.)
Fast forward/rewind time	Approx. 100sec. for C-60
Wow & flutter	0.08 % (WRMS)
Frequency response	Metal: 30 – 19,000Hz (± 3dB)
Stereo separation	45dB
Signal-to-noise ratio	Metal: Dolby B NR IN: 65dB (IEC-A network) Dolby NR OUT: 57dB (IEC-A network)

### • US, CA Model

<b>FM tuner</b>	
Frequency range	87.9 – 107.9 MHz
Usable sensitivity	11 dBf (1.0 μV/75 Ω, mono, S/N: 30 dB)
50 dB quieting sensitivity	16 dBf (1.7 μV/75 Ω, mono)
Signal-to-noise ratio	70 dB (IHF-A network)
Distortion	0.3% (at 65 dBf, 1 kHz, stereo)
Frequency response	30 – 15,000 Hz (± 3 dB)
Stereo separation	40 dB (at 65 dBf, 1 kHz)
Selectivity	70 dB (2ACA) (± 400 kHz)
Three-signal intermodulation (desire signal level)	50 dBf (two undesire signal level: 110 dBf)
<b>AM tuner</b>	
Frequency range	530 – 1,710 kHz
Usable sensitivity	18 μV (25 dB) (S/N: 20 dB)
Selectivity	50 dB (± 10 kHz)

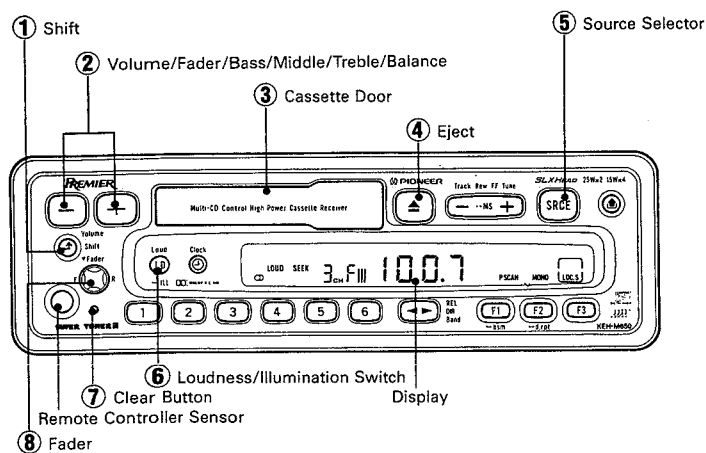
### • ES Model

<b>FM tuner</b>	
Frequency range	87.5 – 108MHz
Usable sensitivity	11dBf (1.0μV/75 Ω, mono, S/N: 30dB)
50dB quieting sensitivity	16dBf (1.7μV/75 Ω, mono)
Signal-to-noise ratio	70dB (IEC-A network)
Distortion	0.3% (at 65dBf, 1kHz, stereo)
Frequency response	30 – 15,000Hz (± 3dB)
Stereo separation	40dB (at 65dBf, 1kHz)
<b>AM tuner</b>	
Frequency range	531 – 1,602kHz (9kHz)
	530 – 1,710kHz (10kHz)
Usable sensitivity	18μV (25dB) (S/N: 20dB)
Selectivity	50dB (± 9kHz)
	50dB (± 10kHz)

*These specifications were determined and are presented in accordance with specification standards established by the Ad Hoc Committee of Car Stereo Manufacturers.*

**Note:**  
Specifications and the design are subject to possible modification without notice due to improvements.

# 1. SWITCHING POWER ON/ADJUSTING VOLUME AND TONE



## Adjusting the Fader

This fader controls the balance between speakers **1**, **2**, and **3**, and speakers **4**, which are shown in Figure. Press the (–) side of Button **2** to raise the volume of speakers **1**, **2** and **3** only; press the (+) side to raise the volume of speakers **4** only.

- The unit has two faders: the electronic preamp fader and the power fader controlled by Fader Control Knob **8**. The use of both faders depend on the way the speakers are connected. For details, see "Using the Fader".

FAD. 0

## Adjusting Bass

Pressing the (+) side of Button **2** increases bass, while the (–) side decreases bass.

BAS. 0

## Adjusting Middle

Pressing the (+) side of Button **2** increases middle, while the (–) side decreases middle.

MID. 0

## Adjusting Treble

Pressing the (+) side of Button **2** increases treble, while the (–) side decreases treble.

TRE. 0

## Adjusting Balance

Pressing the (–) side of Button **2** shifts the balance to the left speaker, while the (+) side shifts it to the right speaker.

BAL. 0

- When you're adjusting fader, bass, middle, treble, or balance settings, the indicator will stop at the center setting. About 5 seconds after adjustment has been made, the display returns to its previous state.

## Using the Clear Button

Once all wiring is complete, press Button **7** with a thin, pointed object. Though not a normal occurrence, the microprocessor which controls the operation of this unit can be affected by electrostatic noise. This generally is indicated by such symptoms as no power being supplied when you switch the unit on, failure of buttons and controls, or an abnormal display. Should this happen, press Button **7** with a thin, pointed object to reset the microprocessor. Note that doing so also resets all audio controls, so you will have to make any desired settings again. This operation deletes all memory contents, such as frequencies stored in the preset memory, so you will have to make any desired settings again.

## Switching Power On

### Radio

Press Button **5** to switch the tuner power on. Press Button **5** again to switch the power off.

### Tape

Insert the cassette tape through the Cassette Door **3**, and the power will be automatically turned on to get the tape start being played back. To eject the tape, press the Button **4**.

- You will hear a few consecutive clicks from your unit when you have started the engine with the cassette tape inserted. The sounds are only the sign of your unit's mechanical preparation being made, but does not indicate at all its functional failure.

## Changing the Source

When the cassette tape is inserted, the source changes at each press of the Button **5**: Tape → Radio → OFF. When a Multi-Play CD Player—optionally available Multi-Play CD Player CDX-M60, for example—is connected to your unit, the source changes: Multi-Play CD Player → Tape → Radio → OFF.

## Adjusting Volume/Fader/Bass/Middle/Treble/Balance

To adjust volume, press the Button **2**. The display changes at each press of the Button **1**: Volume → Fader → Bass → Middle → Treble → Balance. Press the Button **2** to adjust the displayed mode.

### Adjusting Volume

Pressing the (+) side of Button **2** increases the volume, while the (–) side decreases it.

VOL. 12

## Using the Loudness Function

Press Button ⑥ and the "LOUD" indicator will appear on the display. This "loudness" function enhances both the high and low ranges of sound to give even more power to output even at low volumes.

## Switching Illumination Colour

You can select either green or amber for the switch illumination color. To switch the color, hold down Button ⑥ for two seconds. Pressing Clear Button ⑦ causes the illumination to be turned green.

## Using Source Level Adjustor

You may wish to adjust volume when you have changed the source to radio, tape, or CD or when you have changed the radio band from FM to AM. You can do so on the basis of the volume of FM as follows:

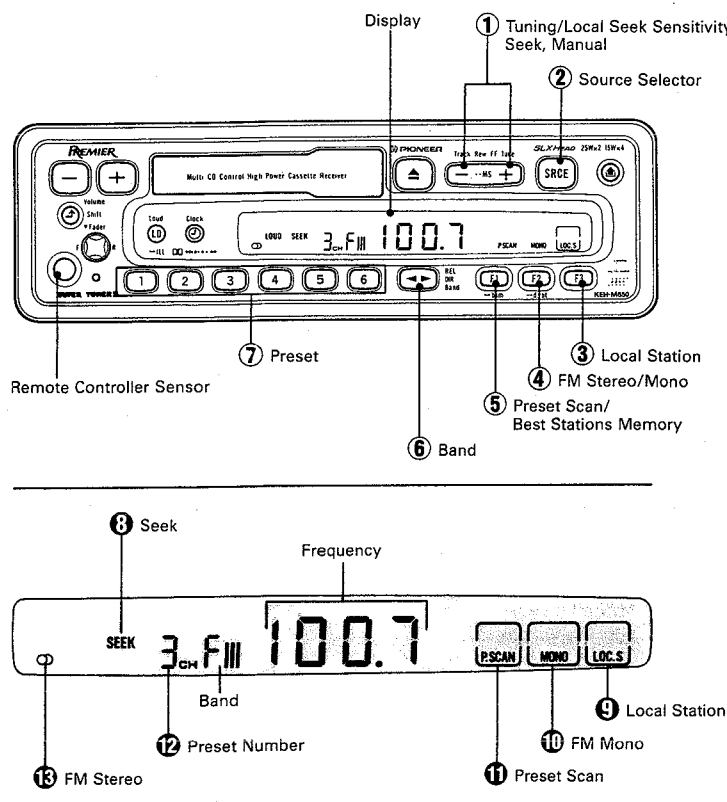
1. Use the Button ⑤ to change the source. (In case of radio, change the band to AM.)
2. Hold down the Button ① for about 2 seconds, and the display will show you the volume of the source.



3. To increase the volume, press the (+) side of the Button ②, and the decrease press the (−) side. You can adjust the volume within a span of V − 4 and V + 4. The display automatically returns to the previous showing when five seconds have elapsed after the adjustment.

- No adjustment can be made when an FM station is tuned in.

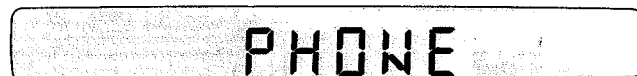
## 2. USING THE RADIO



## Regarding the Cellular Telephone Muting

When the audio mute terminal of a separately sold PIONEER cellular telephone is connected to the cellular mute terminal of the unit, the following function becomes active.

When a phone call is received or made on the cellular telephone, the volume is automatically lowered by the unit, and PHONE is shown on the display.



When a call is ended, the volume returns to the previous level and the previous display is shown again.

- When the volume is lowered by the operation of the cellular telephone muting function ("PHONE" is shown on the display), the unit's shift Button ① and the attenuator button of the remote controller unit are disabled.

- 1 Press Button ② to switch the radio power on.
- 2 Press Button ⑥ to select a band.

$F_I \rightarrow F_{II} \rightarrow F_{III} \rightarrow R_I$   
(FM1) (FM2) (FM3) (AM)

- 3 Use seek tuning to tune in a frequency.

Confirm that the "SEEK" indicator ⑧ is shown on the display (if not, press the (+) and (−) sides of Button ① at the same time). Press the (+) side of Button ① to automatically tune in the next higher receivable frequency, and the (−) side for a lower frequency.

- 4 Adjust volume and tone (see page 3).

- 5 Assign the tuned frequency to one of the buttons in Bank ⑦ (preset memory).

Press and hold down one of the buttons in Bank ⑦ for at least two seconds. The frequency is assigned to the selected button when the Preset Number ⑫ stops flashing on the display. Up to 18 FM stations (6 each for FM1, FM2 and FM3), and six AM stations can be assigned to the preset memory buttons in Bank ⑦.

- 6 Once a frequency is assigned to a button in Bank ⑦, you just need to press that button to tune it in.

This also causes the number of the button pressed to appear at Position ⑬ on the display.



## Preset Scan Tuning

This function lets you automatically monitor the stations assigned to the preset buttons.

1. Pressing Button ⑤ turns on the frame of Preset Scan ⑪ and flashes Preset Number ⑫.  
Each station assigned to the buttons in Bank ⑦ will be automatically tuned in for about eight seconds.
2. When you hear a station that you like, press Button ⑤ again to cancel preset scan tuning and remain at that station.

## BSM (Best Stations Memory)

This function automatically locates stronger stations and automatically assigns their frequencies to the buttons in Bank ⑦, from strongest to weakest. It comes in handy when trying to find local stations while driving.

1. Press Button ⑥ and select a band.
2. Hold down Button ⑤. After about two seconds, a "beep" will sound to signal that the BSM search has started. At this time, "BSM" will flash on the display.



3. The frequency display will return once BSM search is complete, and frequencies are assigned to buttons 1 through 6 in Bank ⑦.
  - At the end of the BSM search, the displayed frequency is that assigned to Button ① of Bank ⑦.
  - If there are fewer than six strong stations in the area, some of the buttons in Bank ⑦ will not be assigned frequencies, so they will retain any frequencies assigned to them previously.
  - BSM search may take as long as 30 seconds in areas where there are few strong stations.
  - You can cancel BSM search by pressing Button ⑥.

## Manual Tuning

Use manual tuning when stations are too weak to be picked up by seek tuning.

1. Press both (+) and (–) sides of Button ① at the same time to clear "SEEK" ③.
2. Each press of the (+) side of Button ① increases the frequency in 0.2 MHz steps in the FM band, 10 kHz in the AM band. Pressing the (–) side of Button ① decreases the frequency. Holding down either side of Button ① changes the frequency at high speed.

## Switching between FM stereo and Mono

Generally, it is best to allow the "Super Tuner III" function to automatically set the optimum listening conditions. ⑬ turns on during stereo broadcast is in reception. When there is a large amount of noise, you can press Button ④ for clearer mono reception (The frame of FM Mono ⑩ turns on).

## Adjusting Seek Sensitivity

The seek tuning function of this tuner lets you select between a local setting for reception of strong stations only, and a DX (distant) setting for reception of weaker stations. The local setting also has four seek tuning sensitivity levels for FM and two levels for AM to match local conditions.

## Changing the Local Seek Sensitivity

1. Use Button ⑤ to select a band.
2. Hold down the Button ③ for more than two seconds, and the display will show you the current local seek sensitivity for about five seconds.



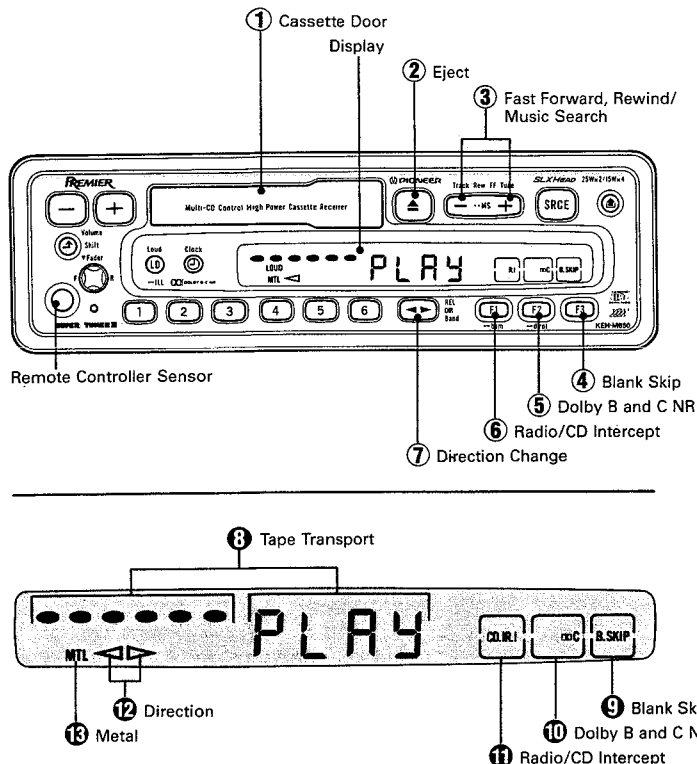
(Example: LOC-2)

3. While the local seek sensitivity remains on the display, press the (+) side of Button ① to increase the sensitivity level, and the (–) side to decrease the level as shown below.  
FM: LOC-1 ⇌ LOC-2 ⇌ LOC-3 ⇌ LOC-4  
AM: LOC-1 ⇌ LOC-2  
The LOC-4 setting allows reception of only the strongest stations, while lower settings let you receive progressively weaker stations.
- The display of local seek sensitivity returns to the frequency when about five seconds have elapsed after the change of sensitivity.

## Switching between Local and DX

Press Button ③ to switch between Local and DX (distant) seek tuning. When the frame of Local Seek ⑨ is lit, seek tuning is performed with the local seek sensitivity. Otherwise, seek tuning is performed with the DX seek sensitivity.

### 3. USING THE TAPE DECK



2. To release the Fast Forward or Rewind function, press the Button ⑦

#### Using Music Search

1. To repeat the current selection (A), press the (–) side of the Button ③ two consecutive times.

R - M5

To hear the following piece of music (B) rather than continue the current selection, press the (+) side of the Button ③ two consecutive times. Pressing the Button ③ three consecutive times makes the normal sequence of playing resume.

F - M5

2. To release the Music Search function, press the Button ⑦.

The following errors will cause the music search function to operate improperly, even though the unit is not malfunctioning.

- Unrecorded "blank" portions between selections less than 4 seconds → the blank portion cannot be detected by the unit.
- Pauses in recorded conversations longer than 4 seconds → the unit reads these as blanks between selections.
- Portions recorded at very low volume for more than 4 seconds → the unit reads these as blanks between selections.

1. Insert the cassette tape into the Slot ①, and power will be turned on and the tape begin being played back.

At this time, the Tape Transport Indicator ⑧ and the Direction Indicator ⑫ will light up.

2. Adjust volume and tone (see page 3).

3. To eject the cassette tape, press the Button ②.

- Power is automatically turned off when the cassette tape has not been set within a few seconds. When this happens, remove the tape by pressing the Button ② because of a possible trouble with the tape.
- A loose or warped label on a cassette tape may interfere with the eject mechanism of the unit or cause the cassette to become jammed in the unit. Avoid using such tapes or remove such labels from the cassette before attempting use.

#### Changing Program

Press the Button ⑦ to change the side of tape from A to B or vice versa.

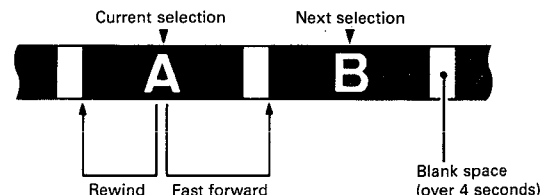
#### Using Fast Forward and Rewind

1. To forward tape fast, press the (+) side of the Button ③.

FF

To rewind tape, press the (–) side.

REW



#### Dolby B and C NR

Press Button ⑤ to listen to a cassette recorded using the Dolby NR system. Each press of Button ⑤ shifts the Dolby NR mode as follows:

Dolby B NR (□□ and the frame at Dolby B and C NR ⑩ turn on) → Dolby C NR (□□ C and the frame at ⑩ turn on) → Dolby NR off (the frame at ⑩ turns off)

#### Auto Tape Selector

When a cassette tape is inserted, the automatic tape selector determines the tape type, and switches between 70 μs and 120 μs equalization. When it is a metal or chrome tape, "MTL" ⑬ comes on. When it is a normal tape, nothing comes on.

#### Blank Skip

Pressing Blank Skip Button ④ turns on the frame at Blank Skip ⑨ and causes the unit to automatically fast forward to the next recorded position when a blank of about 10 seconds is detected on the tape.



## 5. DISASSEMBLY

### • Removing the Case

1. Insert and turn a screwdriver to remove the case.
2. Raise the case to remove.

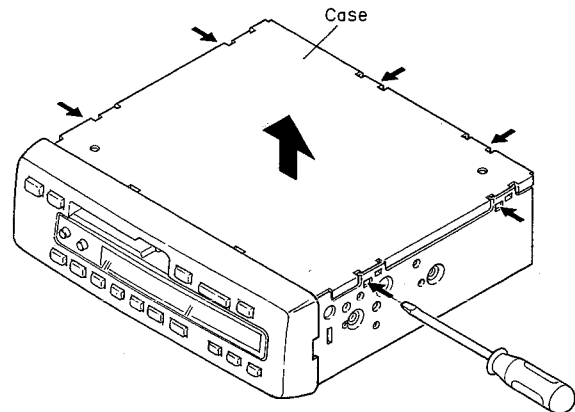


Fig. 1

### • Removing the Cassette Mechanism Assy

1. Remove the four screws.
2. Disconnect the deck unit connector.
3. Remove the cassette mechanism assy.

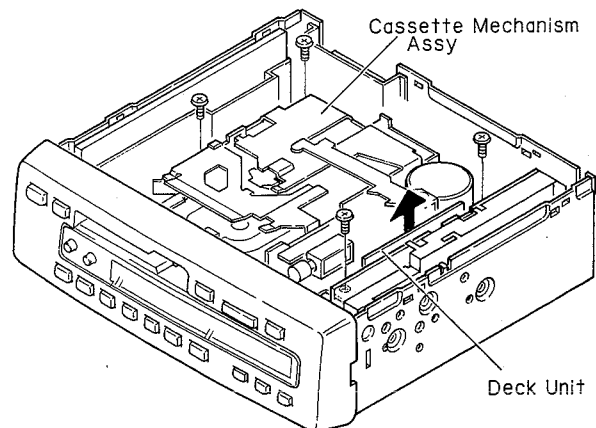


Fig. 2

### • Removing the Grille Assy

1. Disconnect the two connectors.
2. Press the tabs at four locations, and then pull out the grille assy.

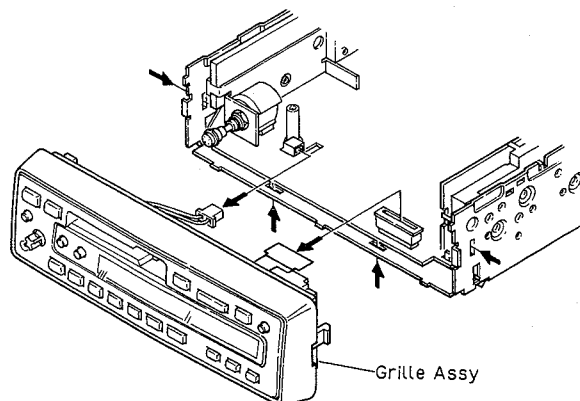
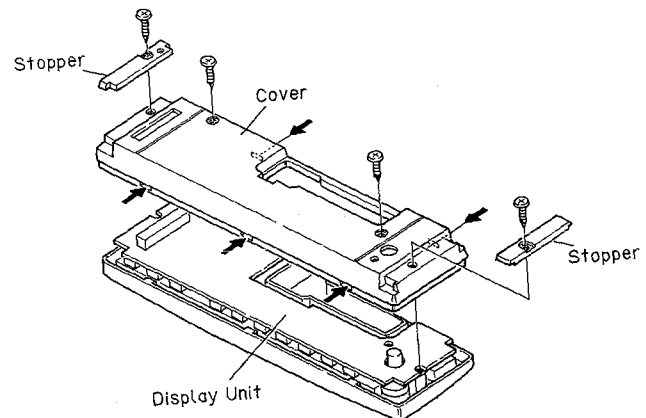


Fig. 3

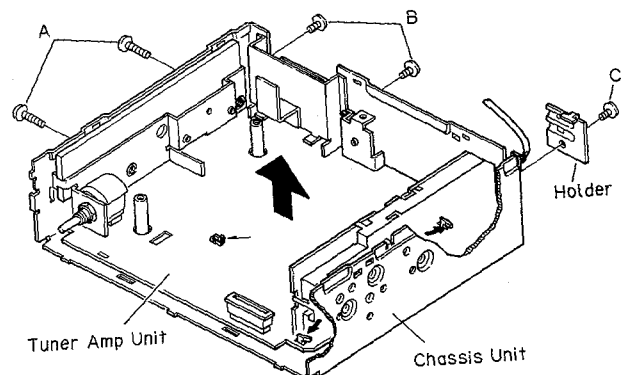
- Removing the Display Unit
- 1. Remove the two screws and then remove the two stoppers.
- 2. Remove the two screws and then remove the cover.
- 3. Remove the display unit.

**Note:**  
The display unit is held together by only four screws. After removing the four screws, remove the cover very carefully. If the cover is removed with too much force, there is a risk of the display unit, lens, button, etc. inside spilling out. To prevent this from happening, as there is a hook located at the part indicated by the arrow in the figure, press and then after removing the hook, remove the cover.



**Fig. 4**

- Removing the Tuner Amp Unit
- 1. Remove the two screws A and the two screws B.
- 2. Remove the screw C and then remove the holder.
- 3. Unbend the tabs at two locations indicated by arrows.
- 4. Remove the solder indicated by arrow.
- 5. Raise up on tuner amp unit to remove it from the chassis unit.



**Fig. 5**

## 6. ADJUSTMENT

### TEST MODE

Test mode is mainly used in adjustment of CD multi-players (such as CDX-M40, CDX-M50).

- Switching to test mode

While pressing the 4 and 6 keys together, switch the back-up ON or release the clear button.

- Canceling test mode

Press the CD multi-player clear button, and then the KEH-M650 (KEH-M8200, KEH-M8250) clear button. Or, switch the CD multi-player and KEH-M650 (KEH-M8200, KEH-M8250) back -up OFF.

- Key functions during test mode

The CD multi-player, deck, and tuner are selected by the SOURCE key.

#### a) CD multi-player

Key	Function
BAND/REL	Regulator ON/OFF
FF	FWD kick
REW	REV kick
F1	Tracking close
F2	Tracking open
F3	Focus close
FF+REW	Carriage/tracking switching

#### b) DECK

No corresponding function. Normal operation executed.

#### c) TUNER

During BSM operation, BSM is canceled when three station are detected. Other keys are used for normal operations.

## ● Flow Chart



## AUDIO/TUNER ADJUSTMENT

### ● Connection Diagram

#### NOTICE:

SELECT C1 so that total capacity of 80pF is attained from the direction of the receiver jack.

Z: Output impedance of SSG.

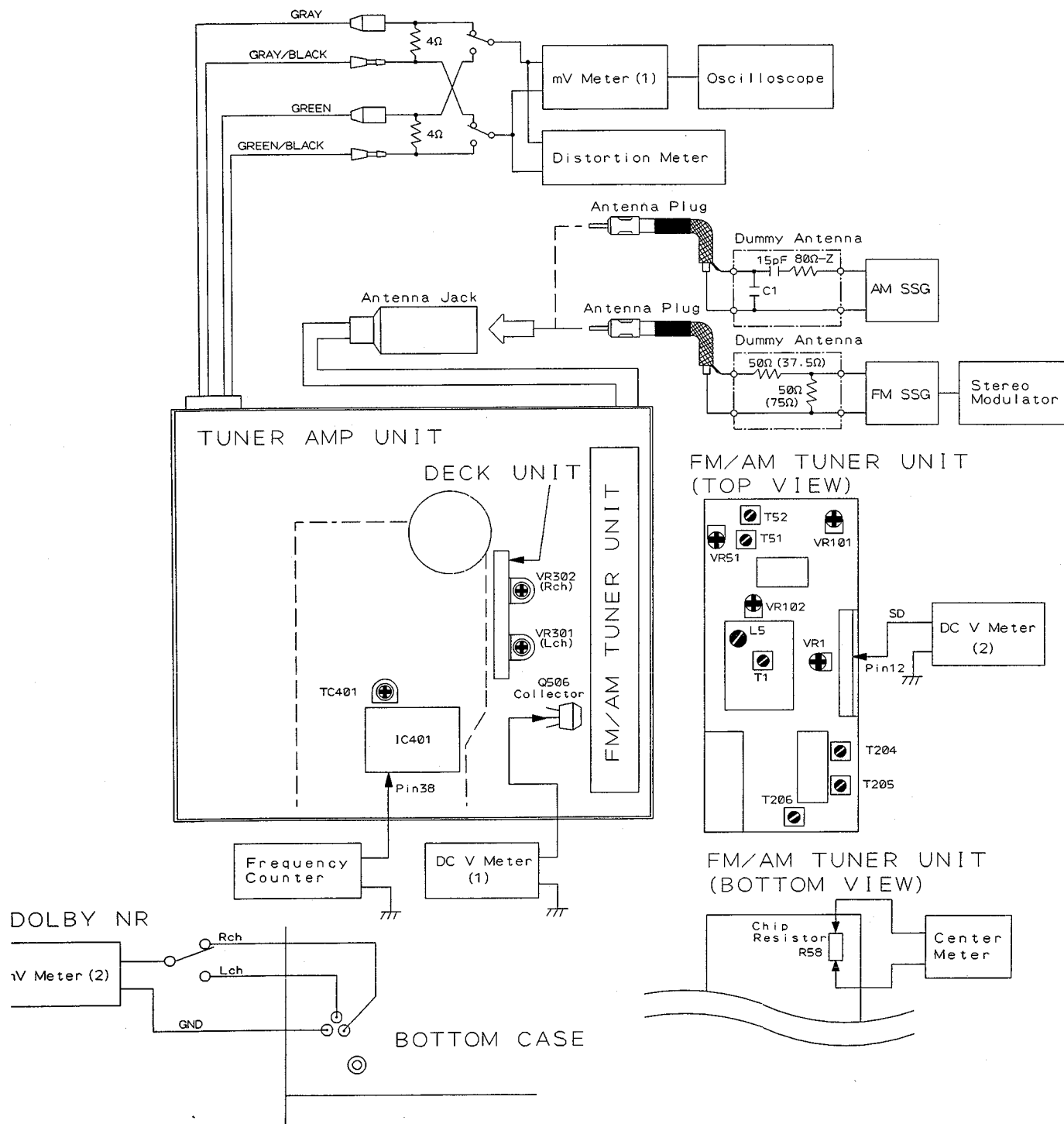


Fig. 6



## FM ADJUSTMENT

※ Stereo MOD. : 1kHz, L+R=90% . Pilot=10%

\*( ) : ES Model

	No.	FM SSG (400Hz, 100%)		Displayed Frequency (MHz)	Adjusting Point	Adjustment Method (Switch Position)
		Frequency (MHz)	Level (dB $\mu$ V)			
IF	1	98.1	60	98.1	T51	Center Meter:0
	2	98.1	60	98.1	T52	Distortion Meter:Minimum
	3	Repeat No.1-2 alternately so that the center meter indicates the 0 output and distortion meter indicates minimum output.				
Front End	1			107.9 *(108)	L5	DC V Meter (1) : $6.2 \pm 0.2$ V
	2			87.9 *(87.5)		Verify that DC V Meter (1) is more than $2.1 \pm 0.6$ V
	3	98.1	8	98.1	T1	Oscilloscope:Optimum Symmetry
	4	98.1※	60	98.1	T1	Distortion Meter:Minimum Rotate T1 less than $\pm 90$
Soft Mute	1	98.1	60	98.1		mV Meter (1) : A dB
	2	98.1	9	98.1	VR102	mV Meter (1) : A-3dB
ARC	1	98.1※	34	98.1	VR101	mV Meter (1) : Separation 5dB
SD	1	98.1	15	98.1	VR51	DC V Meter (2) : Approx. 5V
	2	98.1	14	98.1		Verify that DC V Meter (2) is approx. 0V.
	3	98.1	55	98.1	VR1	DC V Meter (2) : Approx. 5V
		Connect collector of Q2 to GND. Connect DC regulated power supply to pin 3 of FM front end through resistor (330 $\Omega$ ). Add 4.3v from DC regulated power supply.				
	4	98.1	54	98.1		Verify that DC V Meter (2) is approx. 0V.

**AM ADJUSTMENT**

\*( ): ES model when tuning step at 9kHz.

	No.	AM SSG (400Hz, 30% )		Displayed Frequency (kHz)	Adjusting Point	Adjustment Method (Switch Position)
		Frequency (kHz)	Level (dB $\mu$ V)			
Tuning Volt	1			1,710 *(1,602)	—	Verify that DC V Meter (1) is less than 6.5V.
	2			530 *(531)	—	Verify that DC V Meter (1) is more than 2.0V.
IF	1	1,000 (999)	15	1,000 (999)	T204, 205, 206	mV Meter (1): Maximum

**DOLBY NR ADJUSTMENT**

(KEH-M650/US, KEH-M8200/US, KEH-M8250/CA)

No.	Cassette Tape	Adjusting Point	Adjustment Method (Switch Position)
1	NCT-150 (400Hz, 200nwb/m)	VR301 (Lch) VR302 (Rch)	mV Meter (2): -8.2dBs+1.5dB -0.5dB (DOLBY NR Switch:OFF)

**DOLBY NR ADJUSTMENT (KEH-M8250/ES)**

No.	Cassette Tape	Adjusting Point	Adjustment Method (Switch Position)
1	NCT-150 (400Hz, 200nwb/m)	VR301 (Lch) VR302 (Rch)	mV Meter (2): -7.2dBs $\pm$ 1dB (DOLBY NR Switch:OFF)

**CLOCK ADJUSTMENT**

No.	Adjusting Point	Adjustment Method
1	Tuner Mode	BACK-UP $\rightarrow$ ON, ACC $\rightarrow$ ON
2		Connect pin 32 (TEST.1) of IC401 to pin 58 (VDD)
2	TC401	Frequency Counter: 1,048,576Hz $\pm$ 2Hz

## 7. BLOCK DIAGRAM

● KEH-M650/US

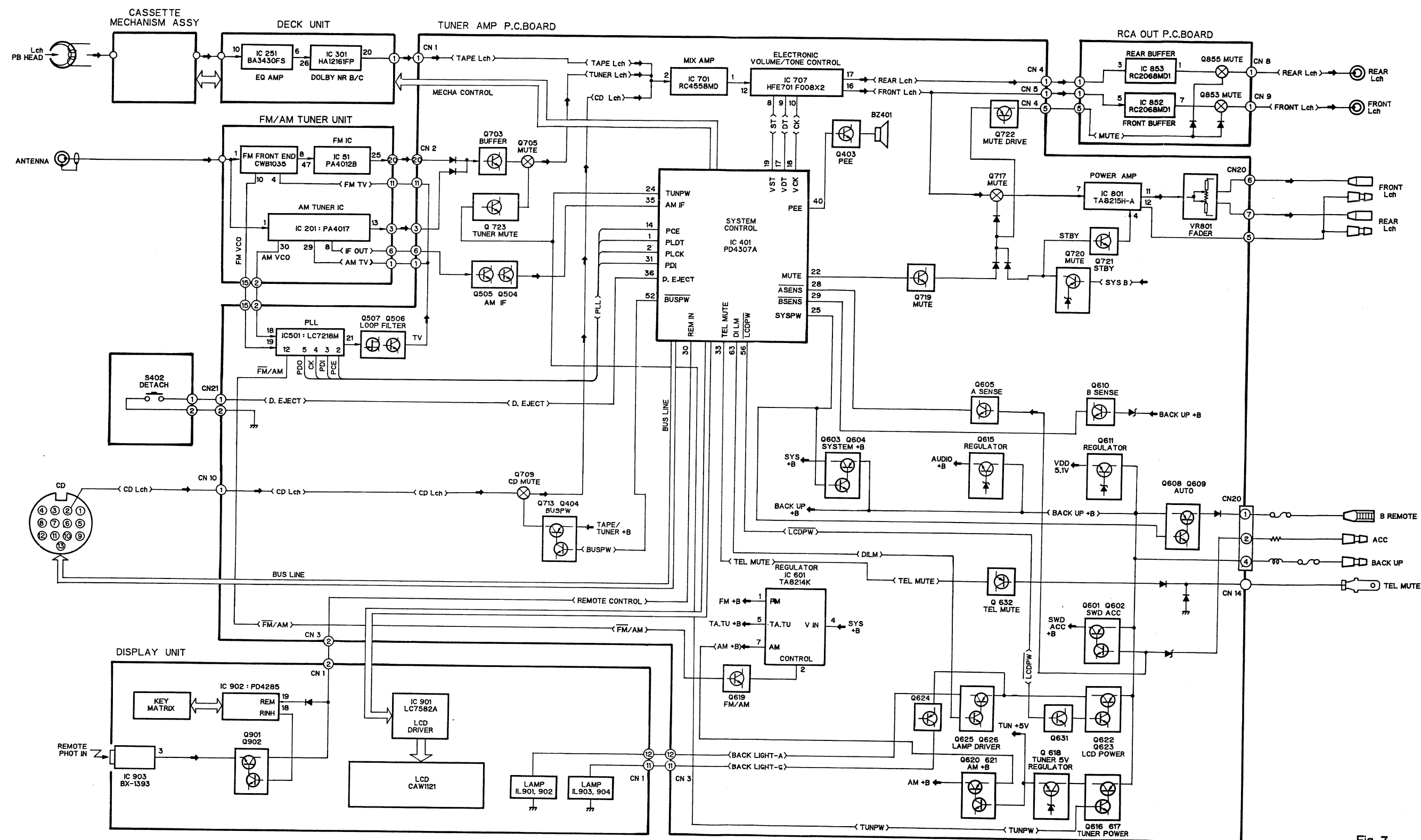
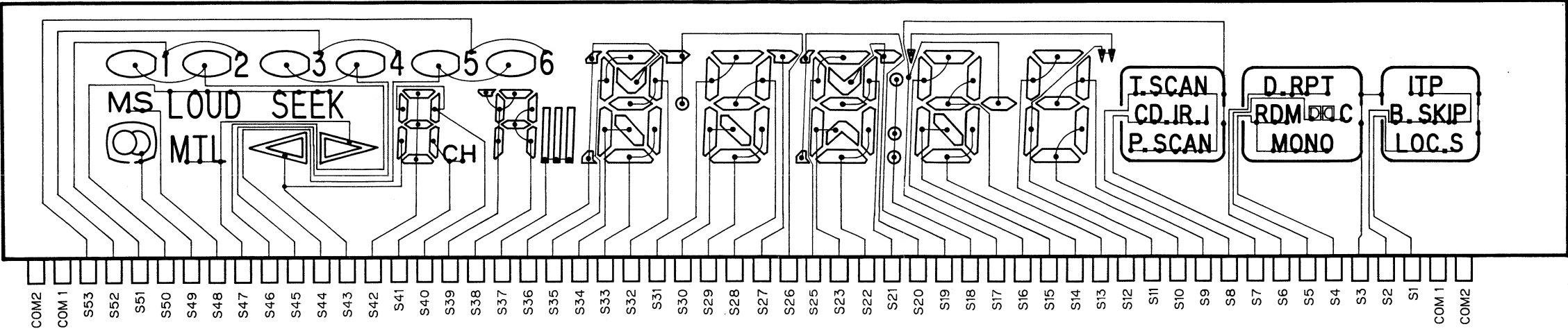


Fig. 7

8. LCD (CAW1133)

SEGMENT



COMMON

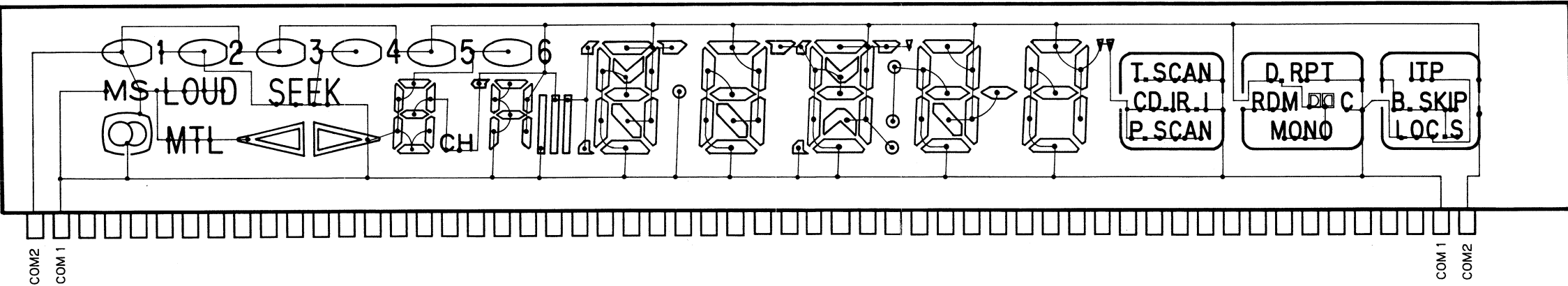
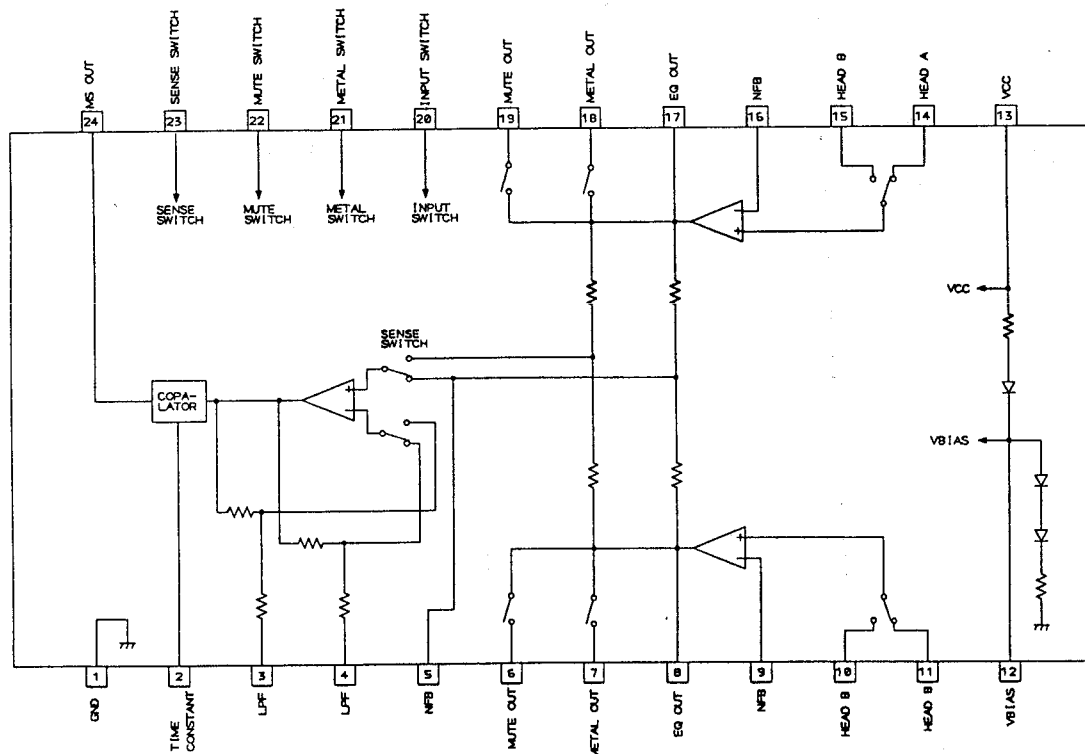


Fig. 8

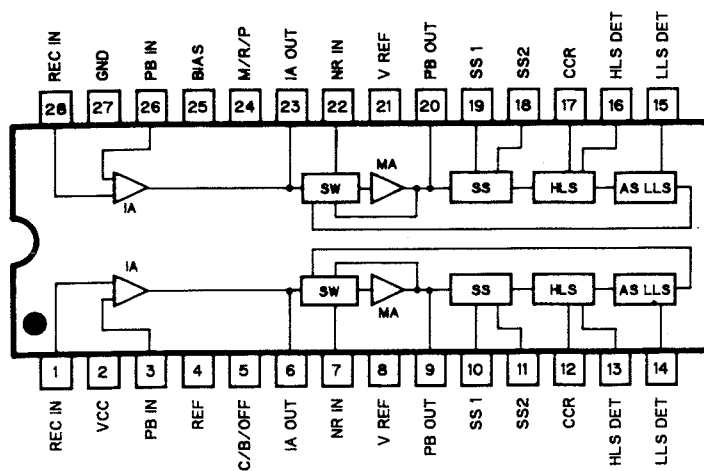
● ICs

IC251:BA3430FS



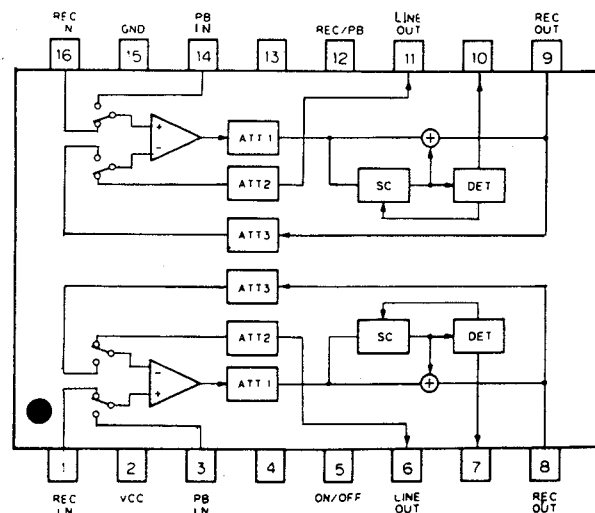
KEH-M650/US, KEH-M8200/US, KEH-M8250/CA

IC301:HA12161FP

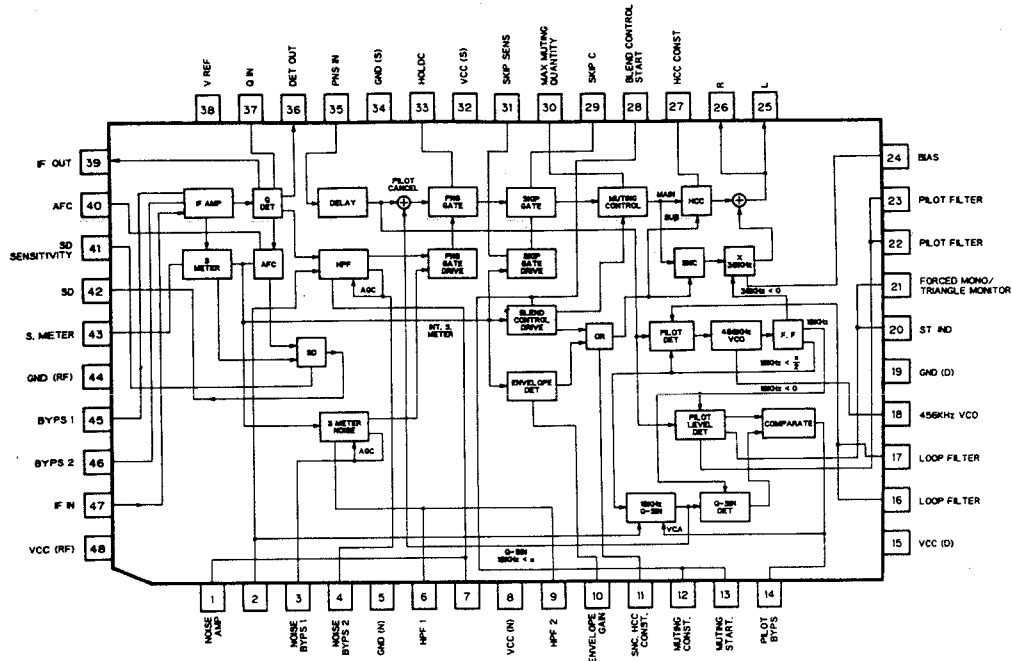


KEH-M8250/ES

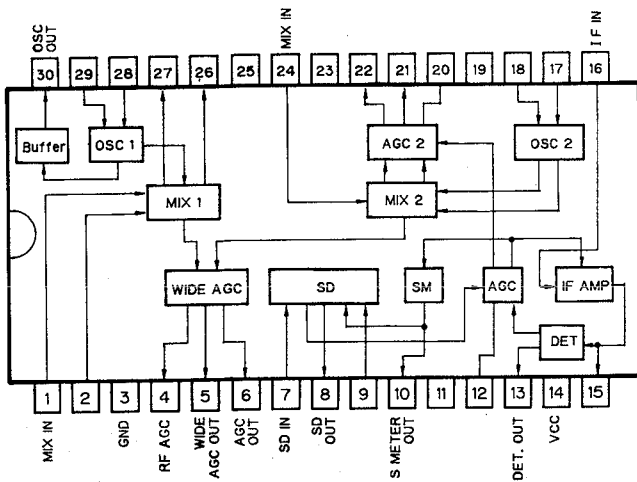
IC301:HA12134FP



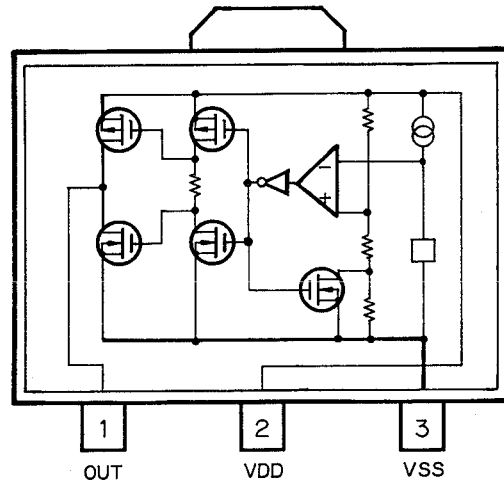
IC51 : PA4012B



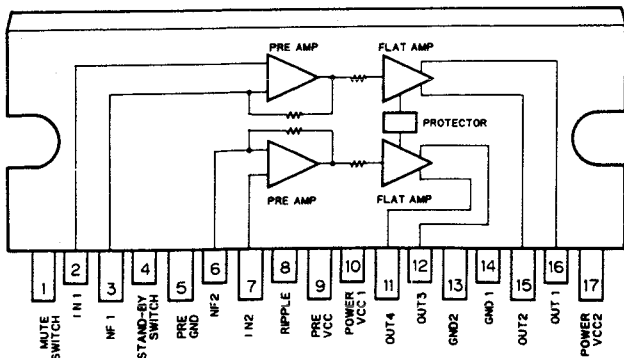
IC201 : PA4017



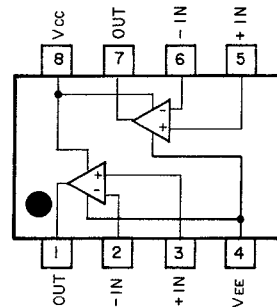
IC904: S-80740AH



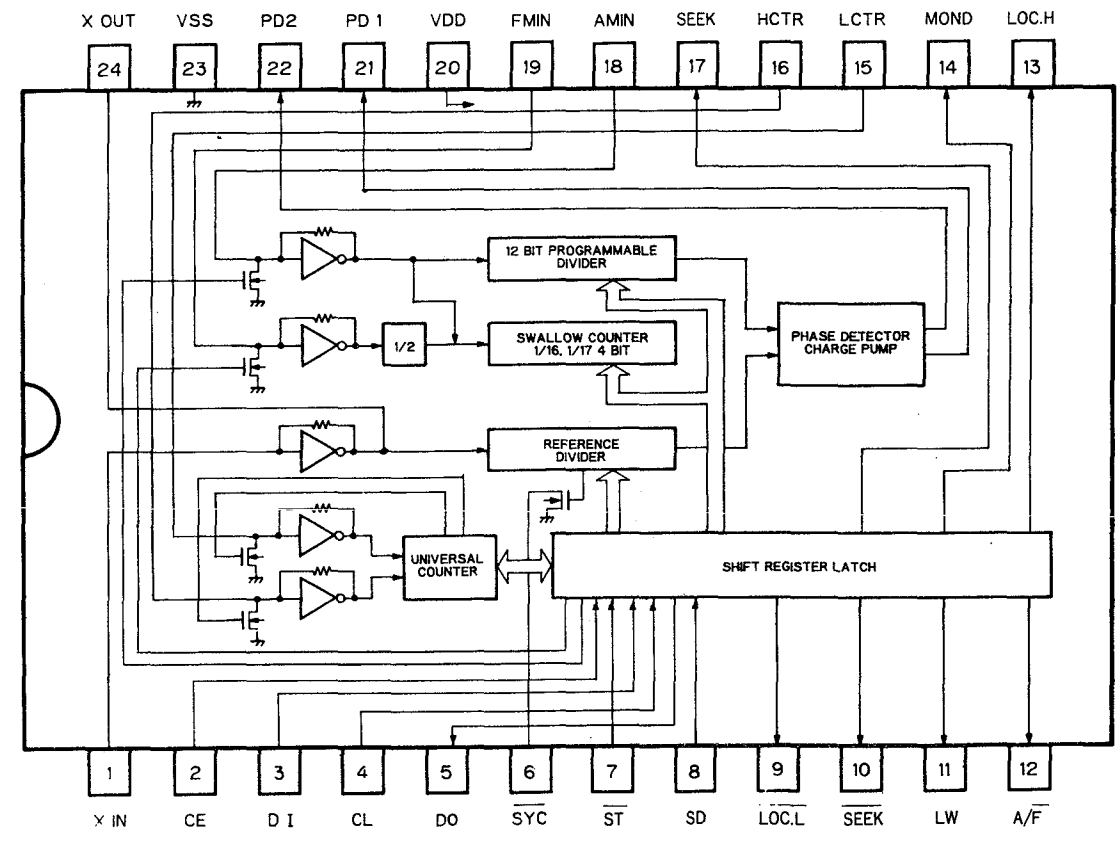
IC801 : TA8215H-A



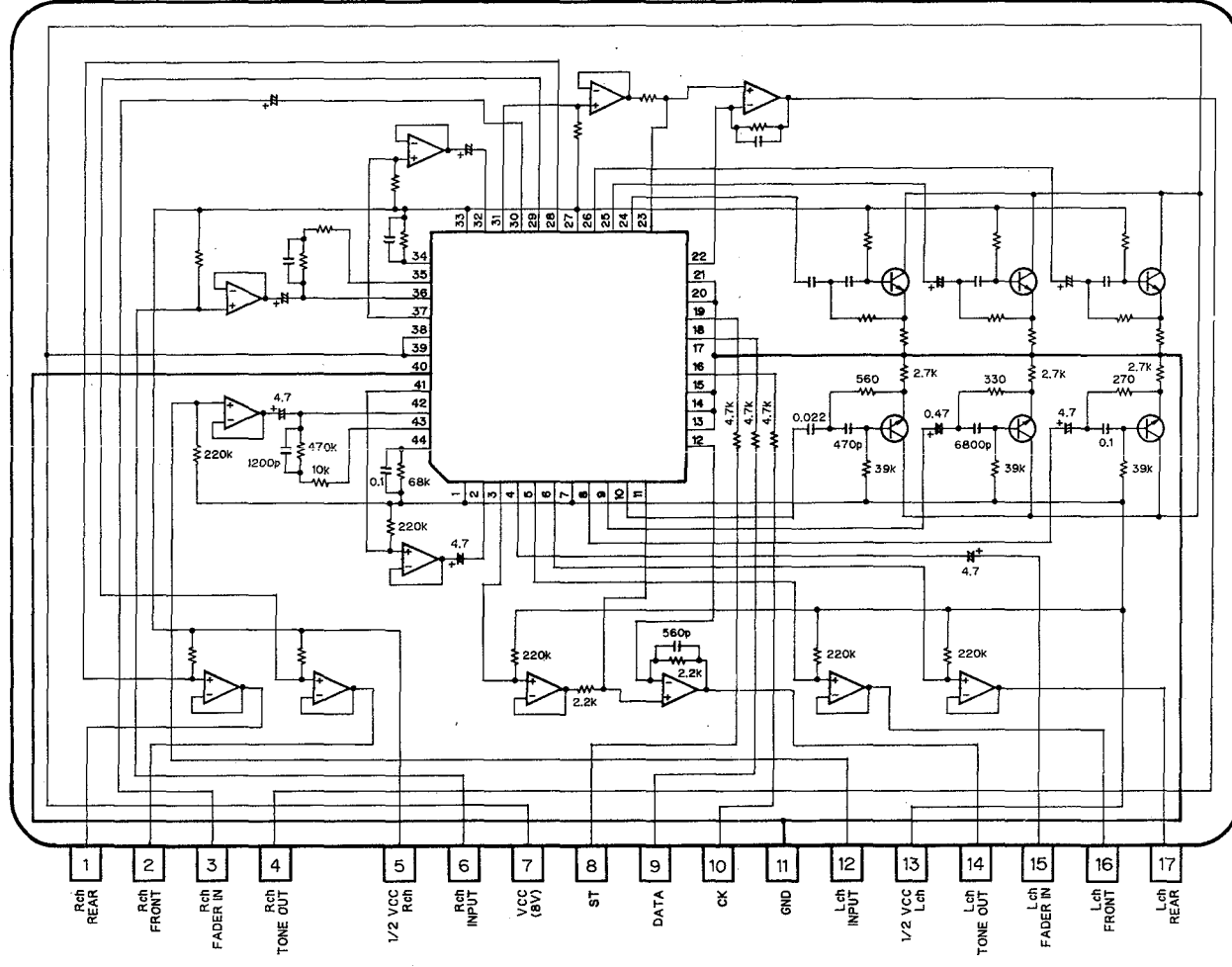
IC701,706 : RC4558MD



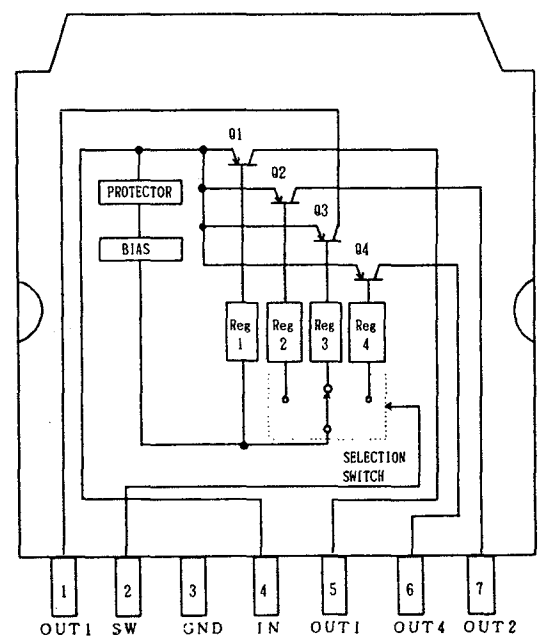
IC501: LC7218M



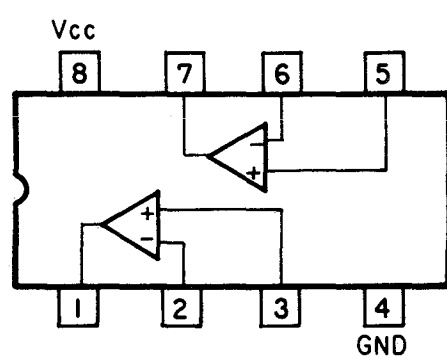
IC707 : HFE701F008X2



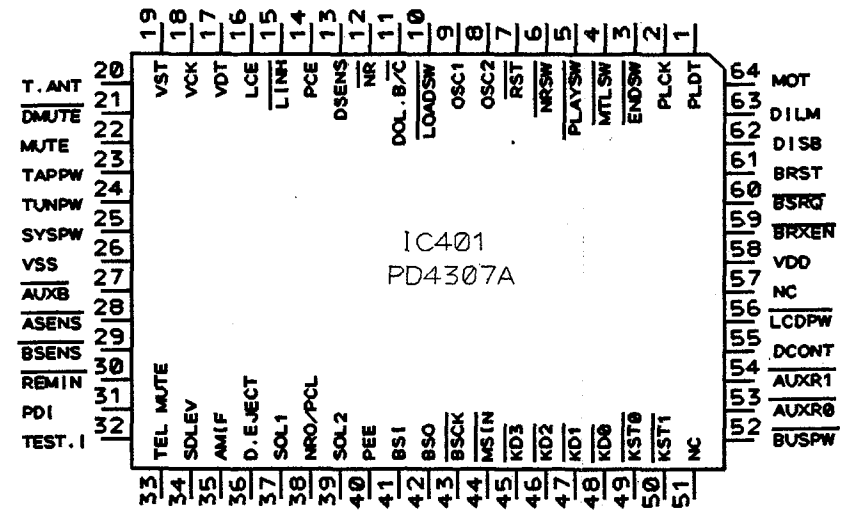
IC601:TA8214K



IC702 : UPC4570G



IC401 : \*PD4307A



## ● Pin Function (PD4307A)

Pin No.	Pin Name	I/O	Output Format	Function and Operation
1	PLDT	Output	C	LCD driver IC and PLL IC data line
2	PLCK	Output	C	LCD driver IC and PLL IC clock line
3	ENDSW	Input		Deck END sensor input
4	MTLSW	Input		Deck METAL (70 $\mu$ S) sensor input
5	PLAYSW	Input		Deck head position (PLAY) sensor input
6	NRSW	Input		Deck FWD/REV sensor input
7	RST	Input		Reset input
8	OSC2			Crystal oscillating element connection pin
9	OSC1			Crystal oscillating element connection pin
10	LOADSW	Input		Deck LOAD/EJECT sensor input
11	DOL. B/C	Output	C	Dolby NR B/C selector output
12	NR	Output	C	Dolby NR ON/OFF selector output
13	DSENS	Input		Front panel EJECT/REPLACE sensor input
14	PCE	Output	C	Chip enable output for PLL IC (IC501:LC7218M)
15	LINH	Output	C	INH control output for LCD driver IC (IC901:LC7582A)
16	LCE	Output	C	Chip enable or strobe output for LCD driver IC (IC901:LC7582A)
17	VDT	Output	C	Data output for electronic volume IC (IC707:HFE701F008X2)
18	VCK	Output	C	Clock output for electronic volume IC (IC707:HFE701F008X2)
19	VST	Output	C	Strobe output for electronic volume IC (IC707:HFE701F008X2)
20	T. ANT	Output	C	Not used
21	DMUTE	Output	C	Deck mute output
22	MUTE	Output	C	System mute output
23	TAPPW	Output	C	Deck power supply control (Not used)
24	TUNPW	Output	C	Tuner power supply control
25	SYSPW	Output	C	System (power amp) power supply control
26	VSS			GND
27	AUXB	Input		AUX B sensor input
28	ASENS	Input		ACC power supply sensor input
29	BSENS	Input		BACK UP power supply sensor input
30	REMIN	Input		Remote control pulse input
31	PD1	Input		Data input for PLL IC (IC501:LC7218M)
32	TEST. I	Input		Test program input
33	TEL MUTE	Input		TEL mute input
34	SDLEV	Input		Signal level input
35	AM IF	Input		AM IF count input
36	D. EJECT	Input		Front panel EJECT sensor input
37	SOL1	Output	C	Output for deck solenoid 1 (head position)
38	NRO/PCL	Output	C	Deck FWD/REV head selector output/PCL clock output
39	SOL2	Output	C	Output for deck solenoid 2 (DIR selector and EJECT)
40	PEE	Output	C	Beep tone output
41	BS1	Input		Bus serial data input
42	BS0	Output	C	Bus serial data output

Pin No.	Pin Name	I/O	Output Format	Function and Operation
43	B $\overline{SCK}$	Input/Output	C	Bus serial clock input/output
44	MSIN	Input		MS pulse/ Blank sensor input
45~48	KD3~KD0	Input		Key return input
49	KST0	Output	NM	Key strobe output
50	KST1	Output	NM	Key strobe output
51	NC			
52	BUSPW	Output	NM	Bus power output
53	AUXR0	Output	NM	AUX remote control output 0
54	AUXR1	Output	NM	AUX remote control output 1
55	D $\overline{CONT}$	Output	NM	SWD VDD for key control IC (PD4285)
56	LCDPW	Output	NM	LCD power supply control
57	NC			
58	VDD			
59	BRXEN	Input/Output	C	Bus reception enable line
60	B $\overline{SRQ}$	Input/Output		Data communications serial poll request
61	BRST	Output	C	Bus reset
62	DISB	Output	C	AUX control output (Not used)
63	DILM	Output	C	Illumination green/amber selector output
64	MOTO	Output	C	Deck main motor control output

Output Format	Meaning
C	CMOS Output
NM	Neutral resistivity N channel open drain

## ● FM Front End (CWB1035)

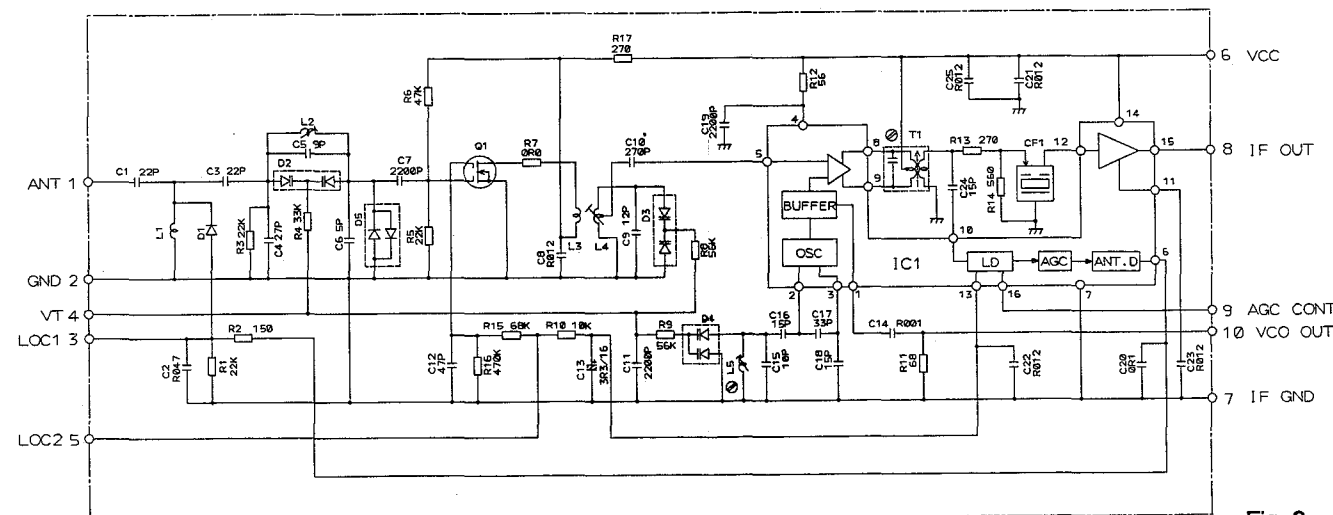


Fig. 9



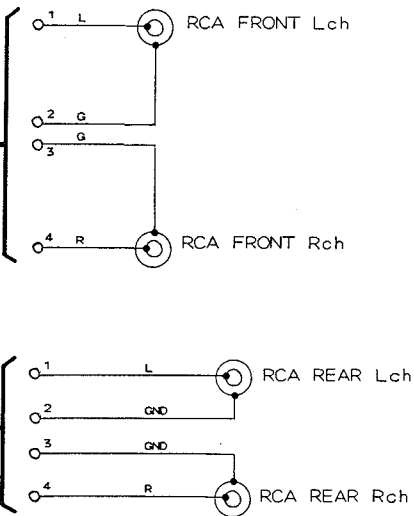
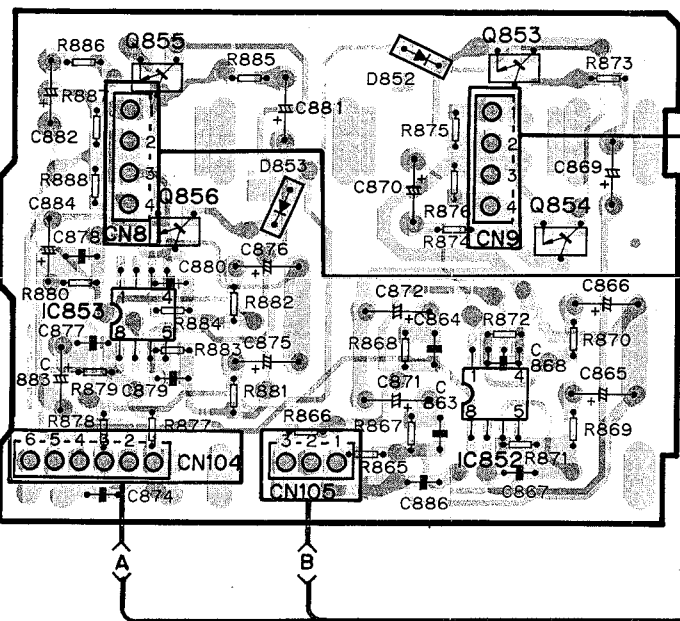
9. CONNECTION DIAGRAM  
(KEH-M650/US, KEH-M8200/US, KEH-M8250/CA)

TUNER AMP P. C. BOA

Q62  
Q618  
Q506 Q502  
IC, Q Q620 Q505  
ADJ

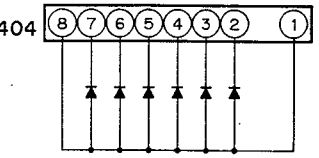
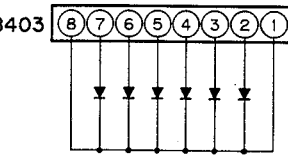
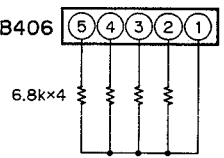
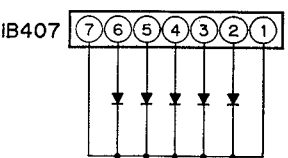
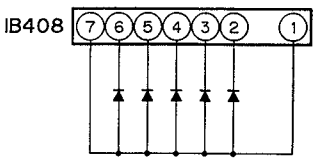
RCA OUT P. C. BOARD

Q855  
IC, Q IC853 Q856  
IC852  
Q853 Q854



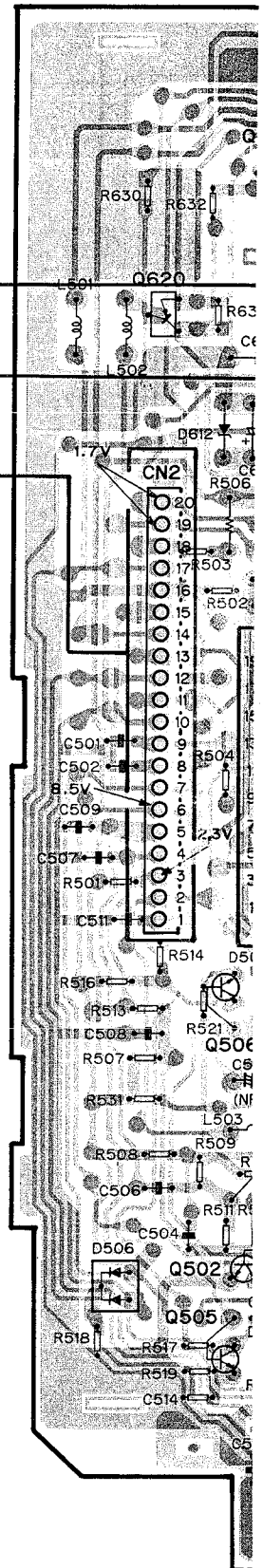
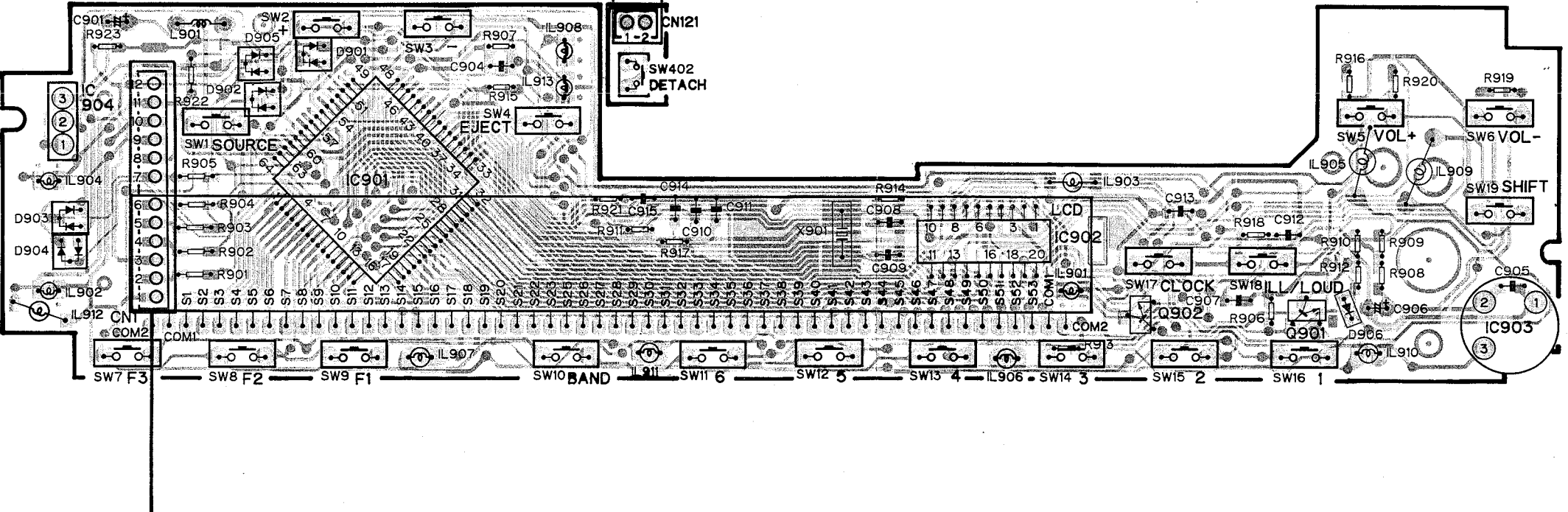
TO DECK UNIT  
CN253

TO FM/AM TUNER UNIT



DISPLAY UNIT

IC, Q IC904 IC901 IC902 Q902 Q901 IC903



# TUNER AMP P. C. BOARD

Q401  
Q621 Q703 Q712 Q706  
Q618 Q507 Q704 Q611 Q617 Q705 Q402 Q709  
Q506 Q502 Q501 Q616 Q619 Q711 Q702 Q723 Q710  
Q620 Q505 Q504 Q503 IC501 Q701 Q706 Q713  
IC, Q Q609 Q608  
ADJ TC401  
Q615 Q404 Q604 IC702 Q603  
Q722 Q631 Q601 Q610 Q717 Q719  
Q626 Q623 Q403  
Q632 Q721 Q720 IC402 IC801

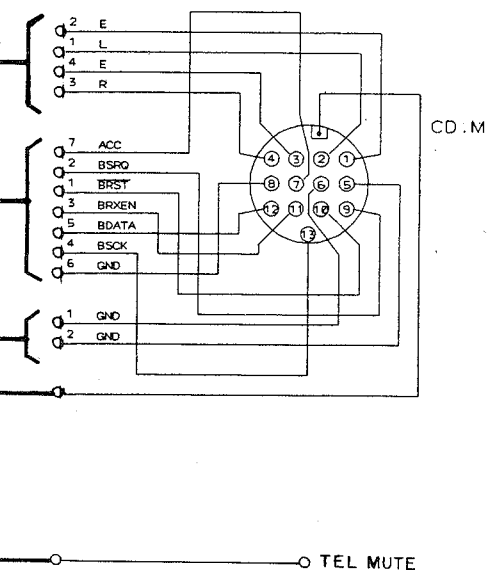
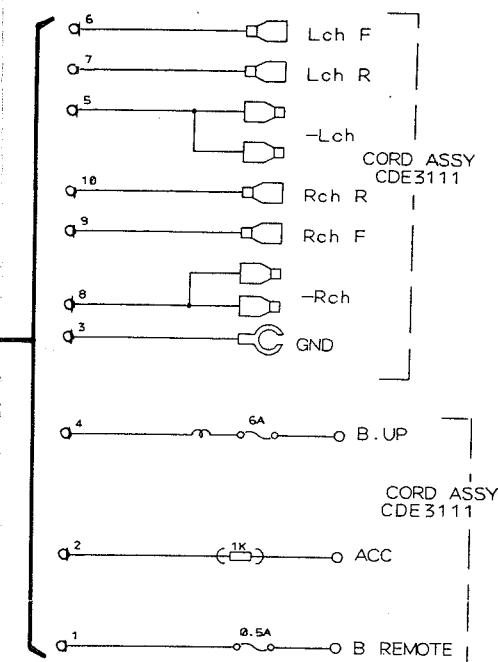
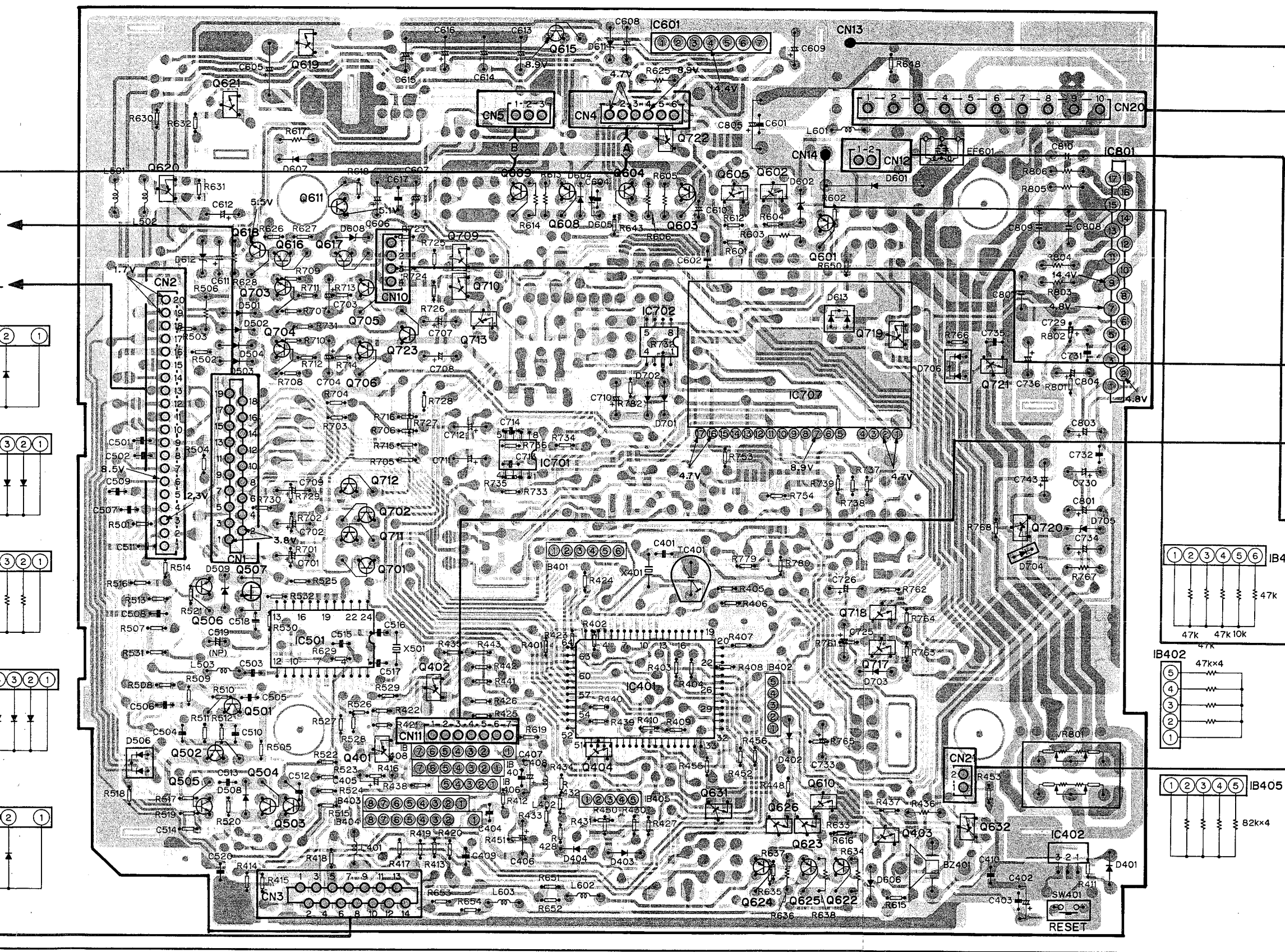
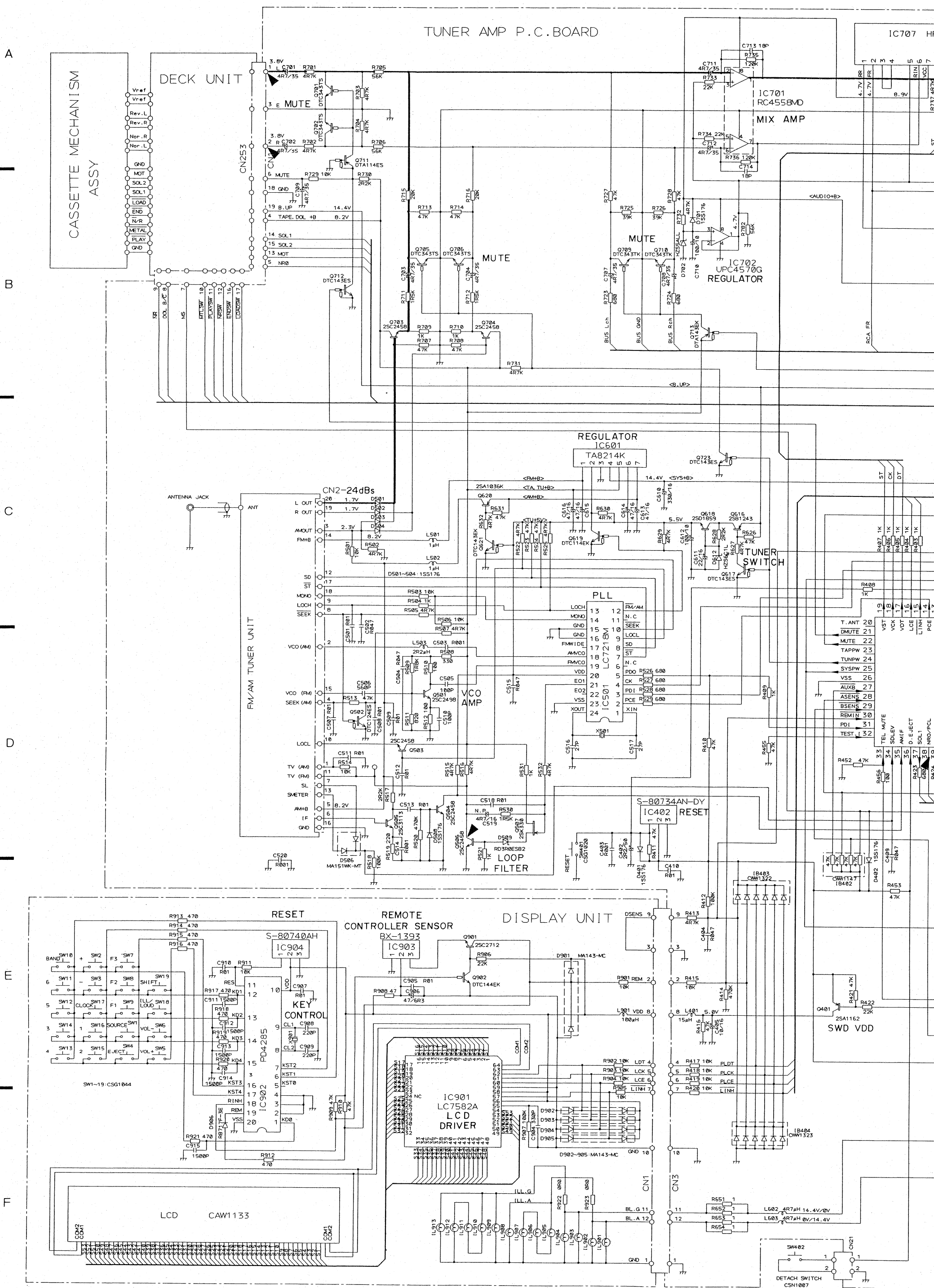
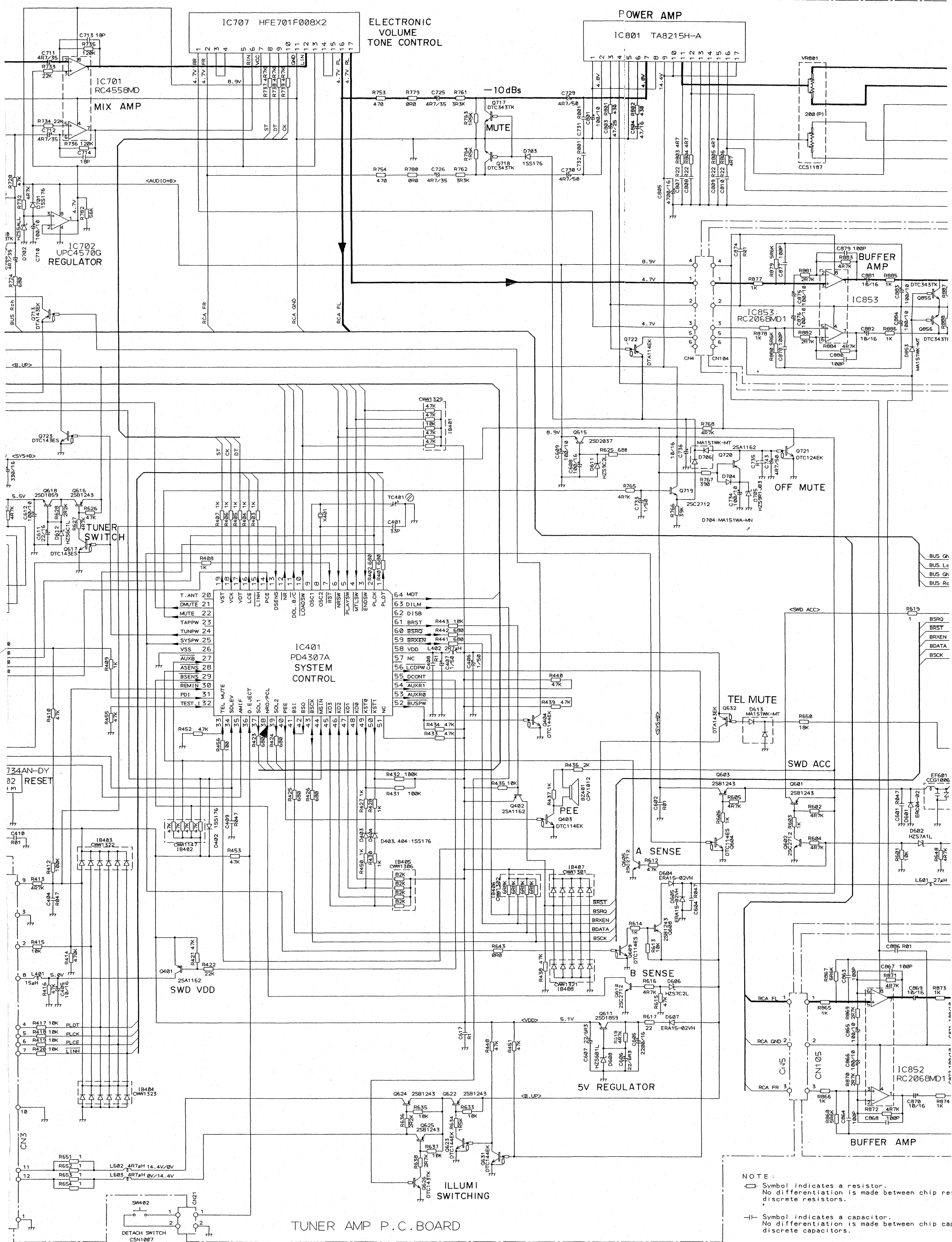


Fig. 10



# 10. SCHEMATIC CIRCUIT DIAGRAM (KEH-M650/US, KEH-M8200/US, KEH-M8250/CA)





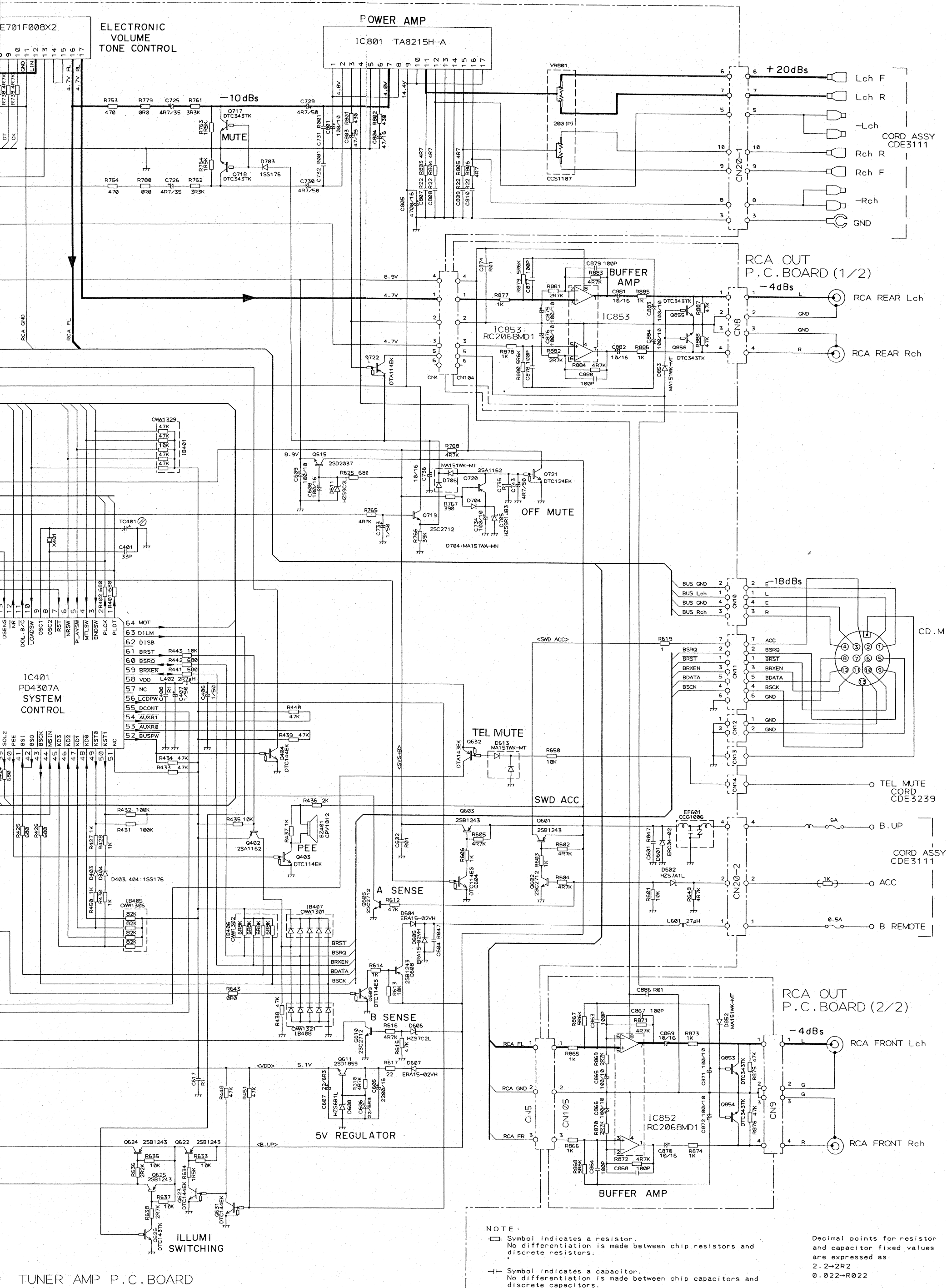


Fig. 11

F







Fig. 12

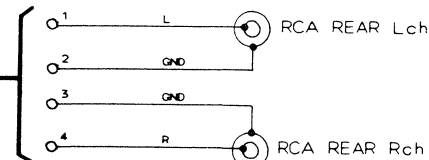
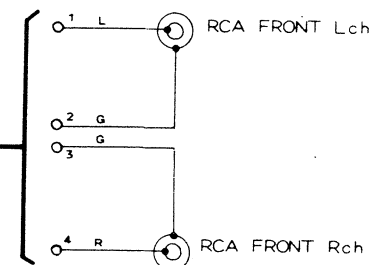
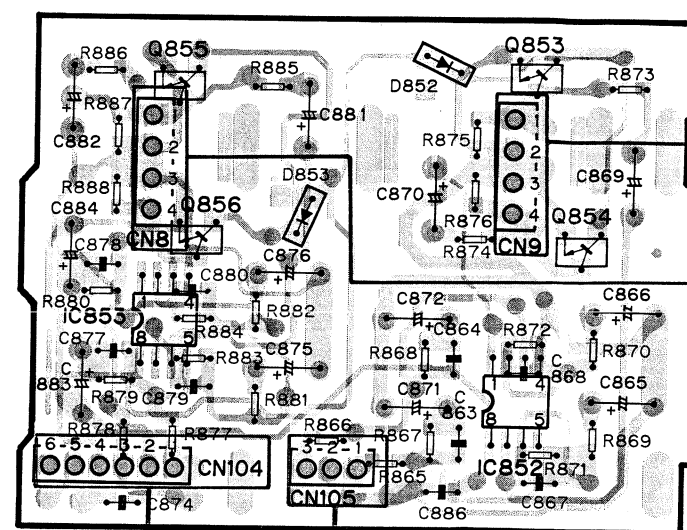
# 12. CONNECTION DIAGRAM (KEH-M8250/ES)

TUNER AMP F

## RCA OUT P. C. BOARD

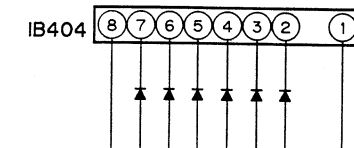
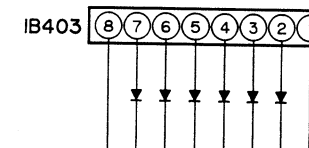
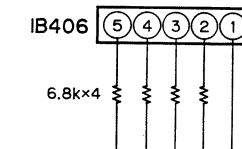
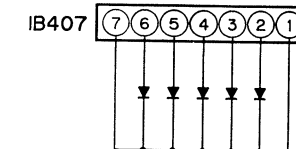
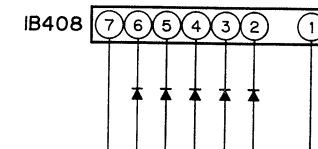
IC. Q Q855  
IC853 Q856

IC852  
Q853 Q854



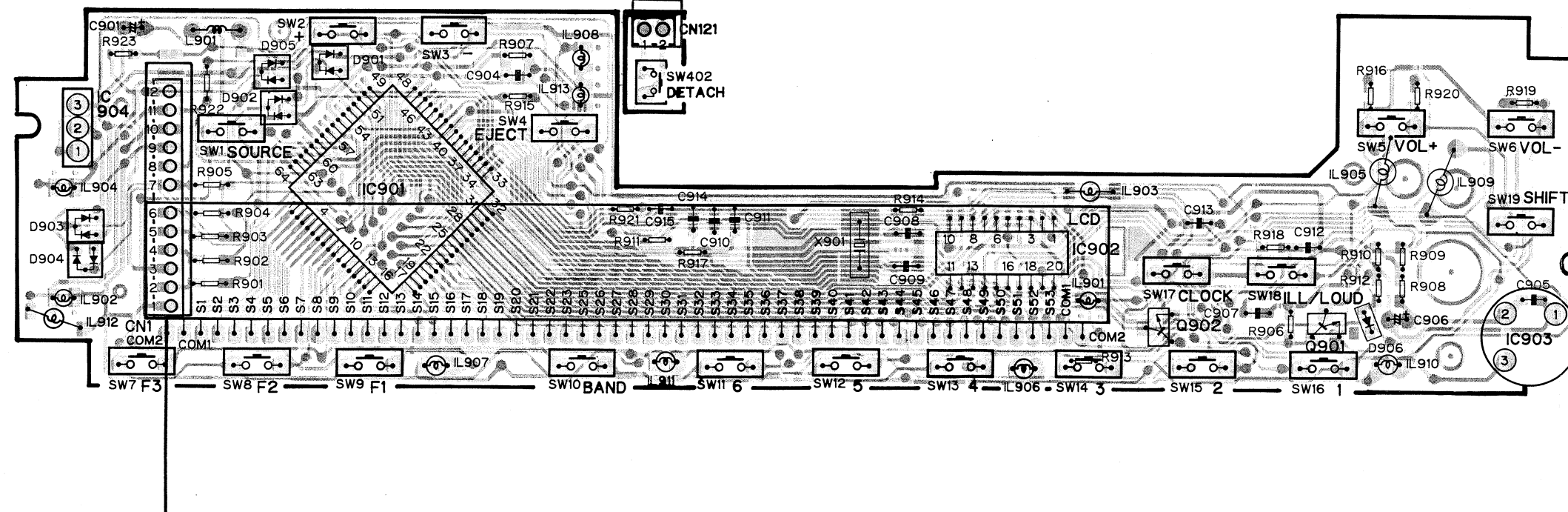
TO DECK UNIT  
CN253

TO  
FM/AM TUNER UNIT

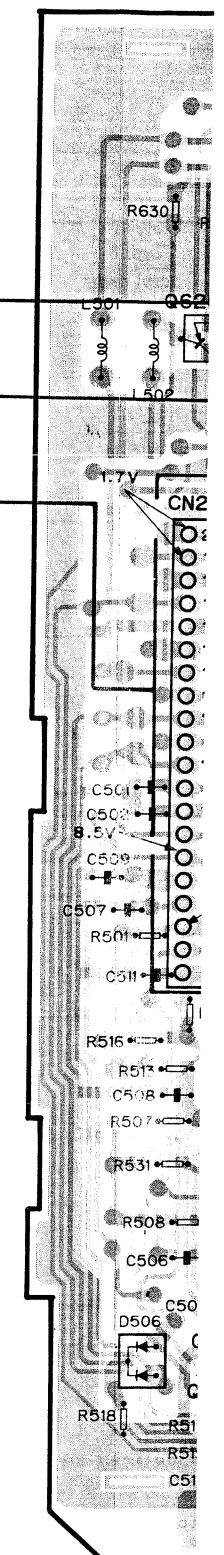


## DISPLAY UNIT

IC. Q IC904 IC901 IC902 Q902 Q901 IC903



IC. Q  
ADJ





## TUNER AMP P. C. BOARD

Q621 Q703 Q712 Q706 Q401  
 Q618 Q507 Q704 Q611 Q617 Q705 Q402 Q709 IC701  
 Q506 Q502 Q501 Q616 Q619 Q711 Q702 Q723 Q710 Q615 Q404 Q604 IC702 Q603 Q601 Q610 Q717 Q719  
 IC. Q Q620 Q505 Q504 Q503 IC501 Q701 Q706 Q713 Q609 Q608 Q722 Q631 Q626 Q623 Q403  
 ADJ TC401 IC401 IC601 Q605 Q602 Q624 Q625 Q622 Q721 Q720 IC402 IC801

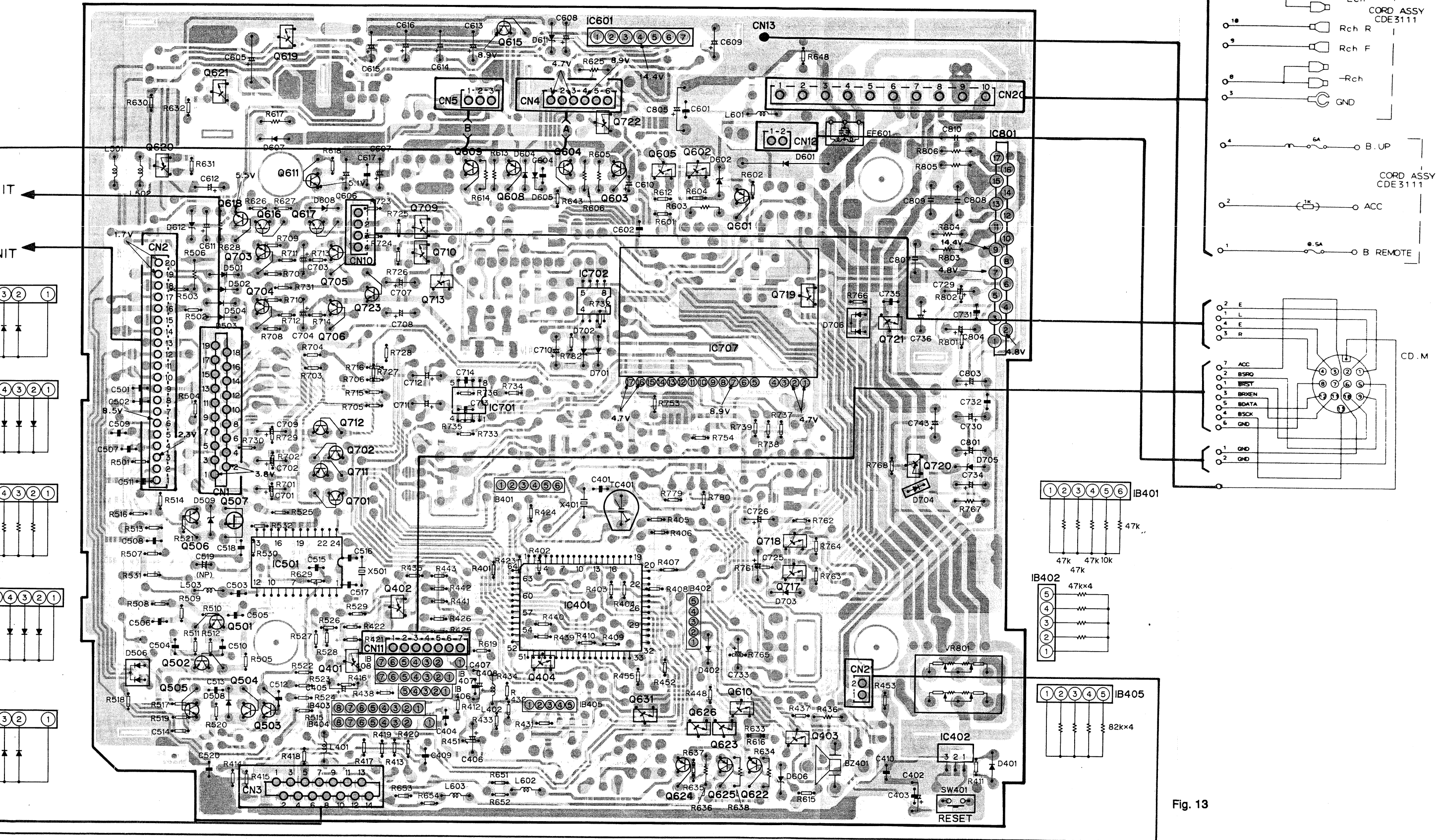


Fig. 13

A

B

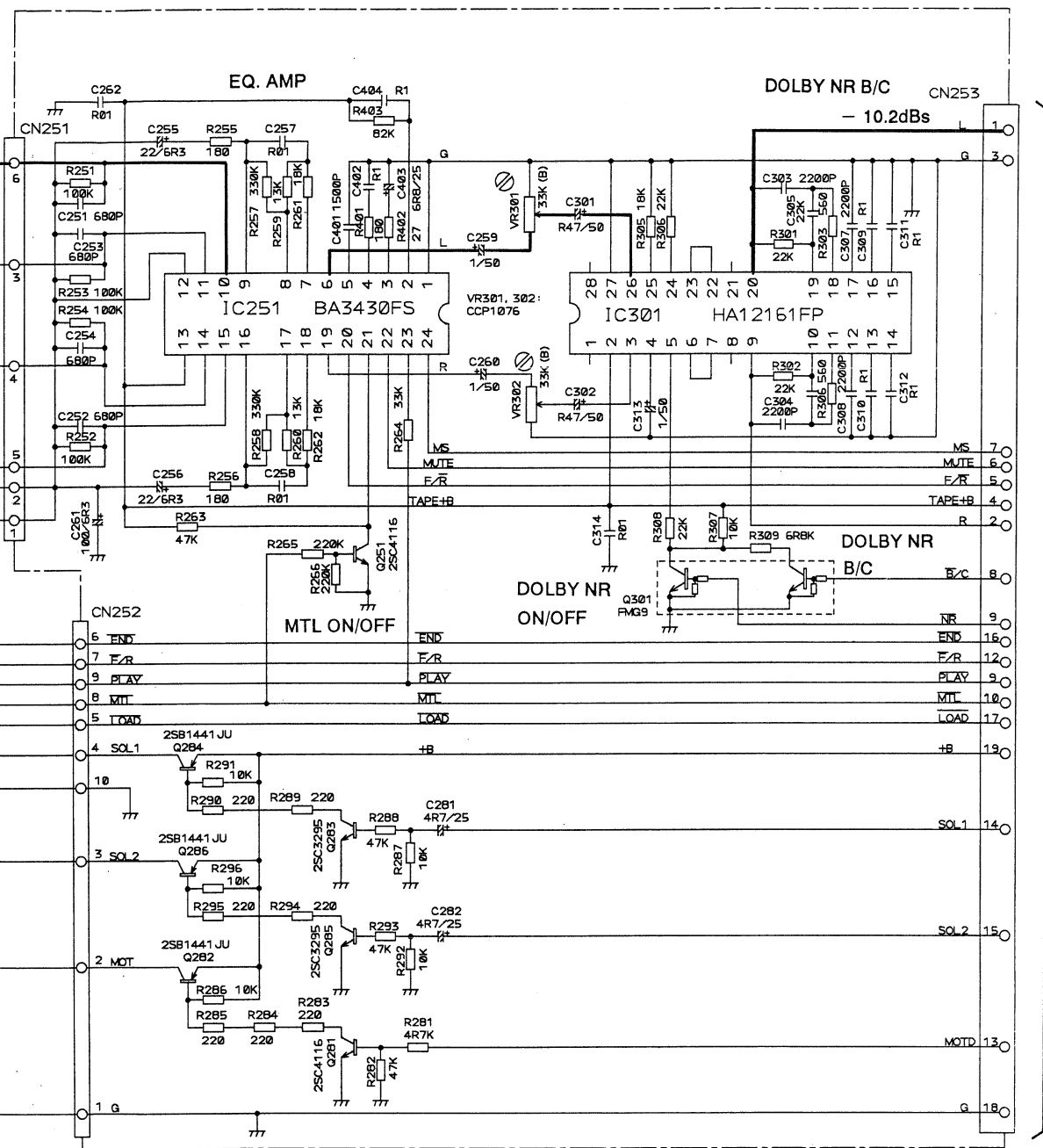
C

D



● KEH-M650/US, KEH-M8200/US, KEH-M8250/CA (DECK UNIT)

## DECK UNIT



istor.  
made between chip resistors and

acitor.  
made between chip capacitors and

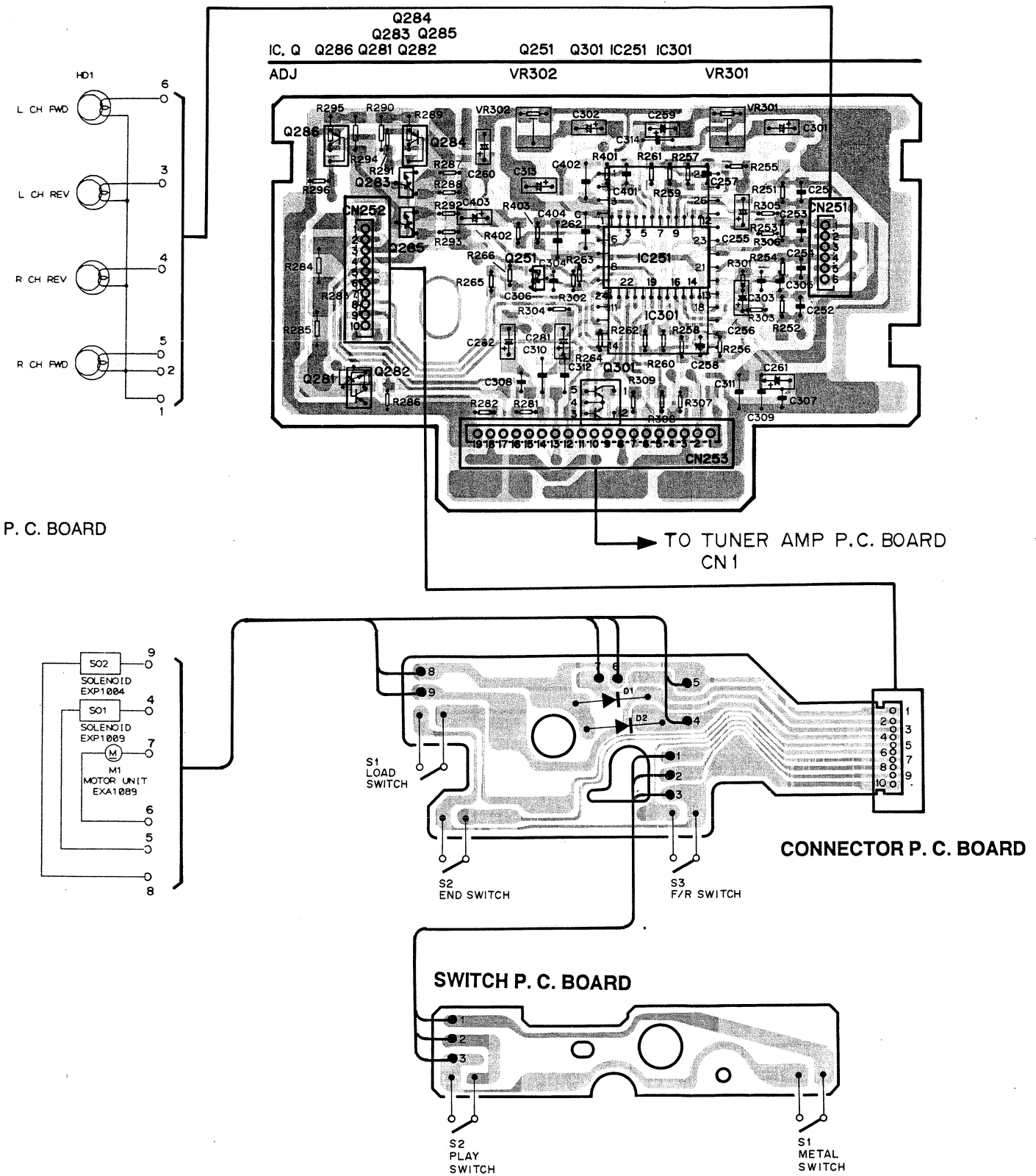
Decimal points for resistor and capacitor fixed values are expressed as:

2.2→2R2

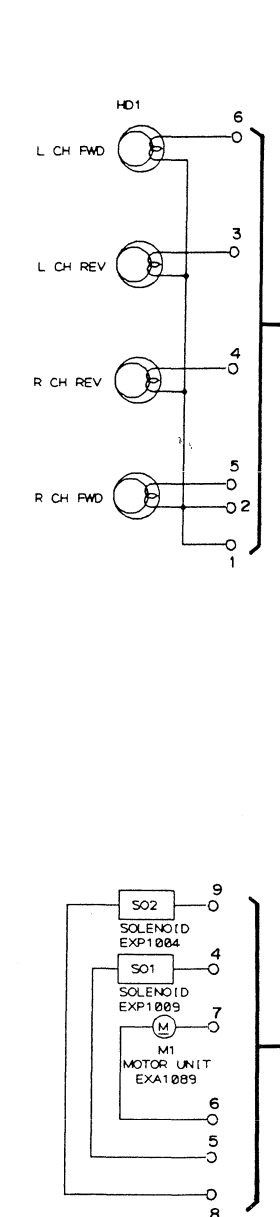
0.022→R022

**Fig. 15**

## DECK UNIT



**Fig. 16**



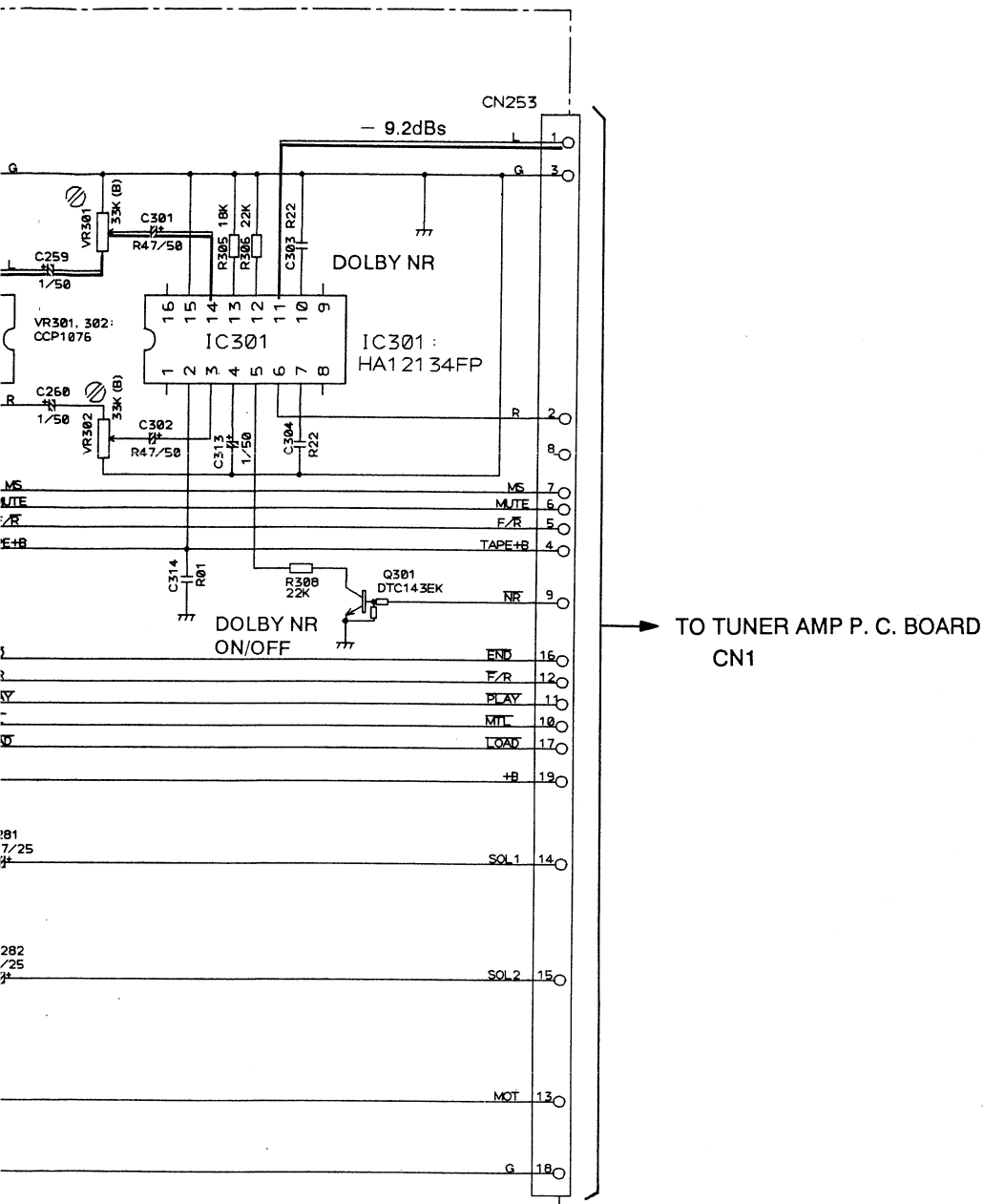
Decimal points for resistor and capacitor fixed values are expressed as:

2.2→2R2

0.022→R022

Fig. 17





**Fig. 17**

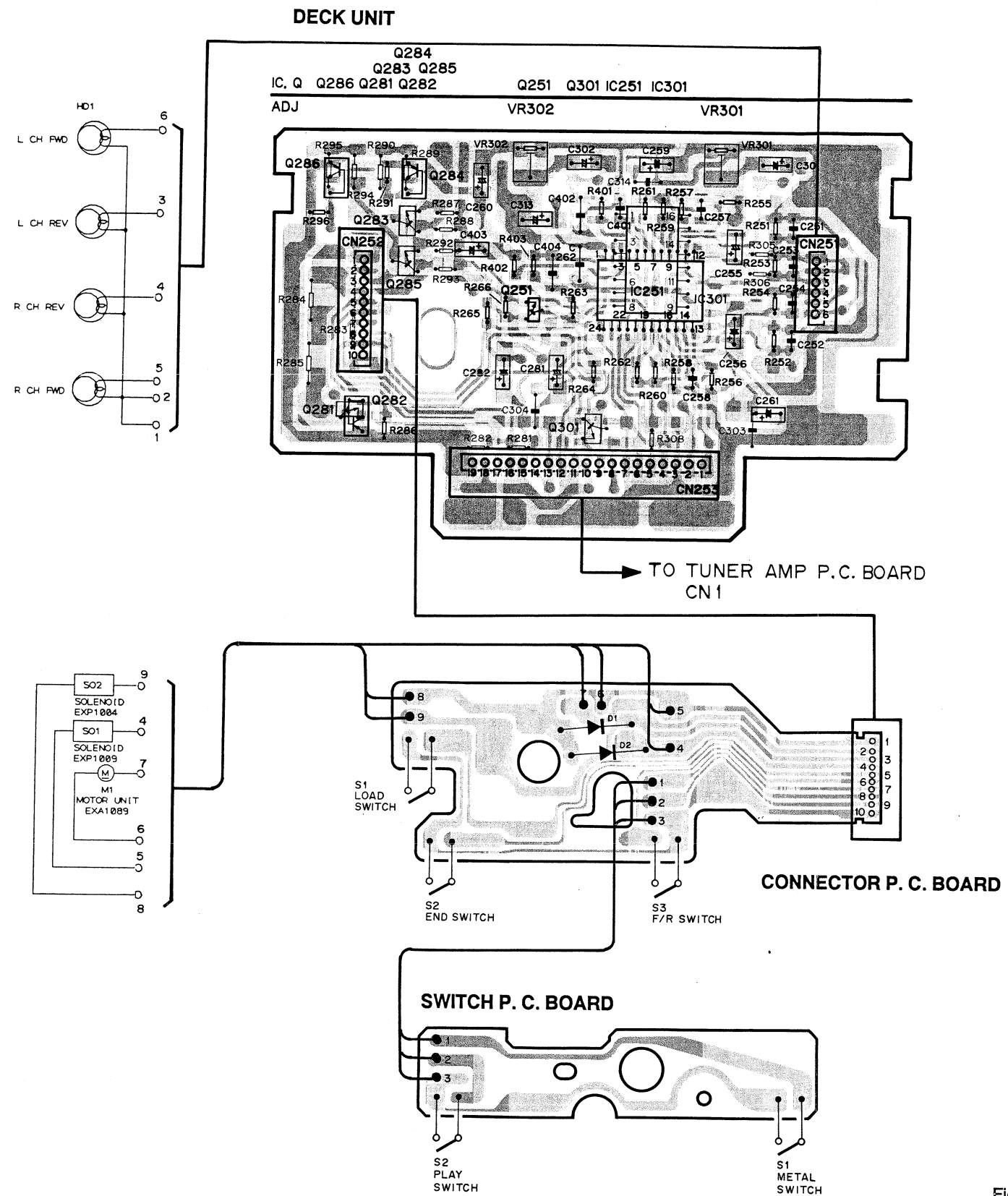
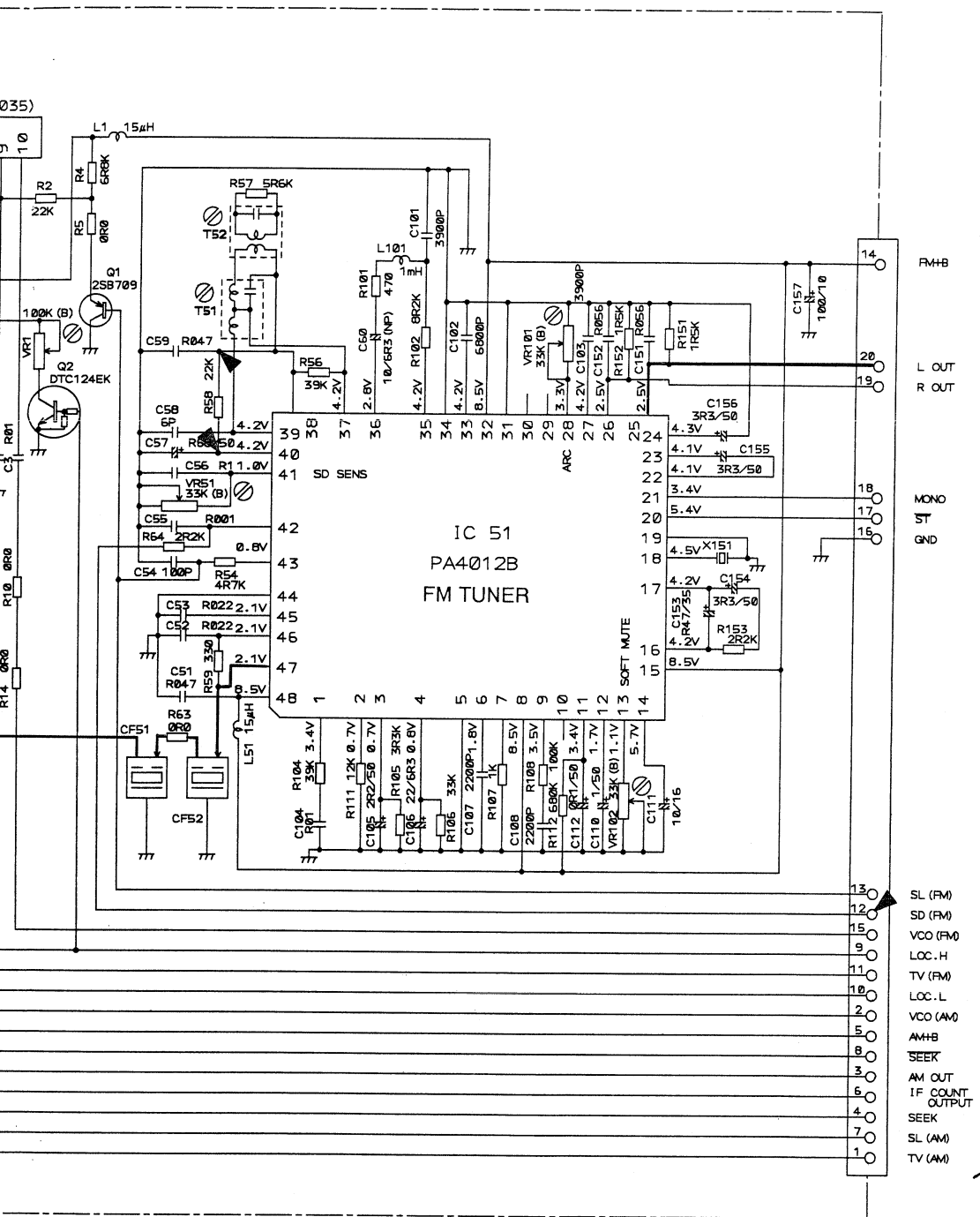


Fig. 18





Decimal points for resistor  
and capacitor fixed values  
are expressed as:  
2.2→2R2  
0.022→R022

Fig. 19

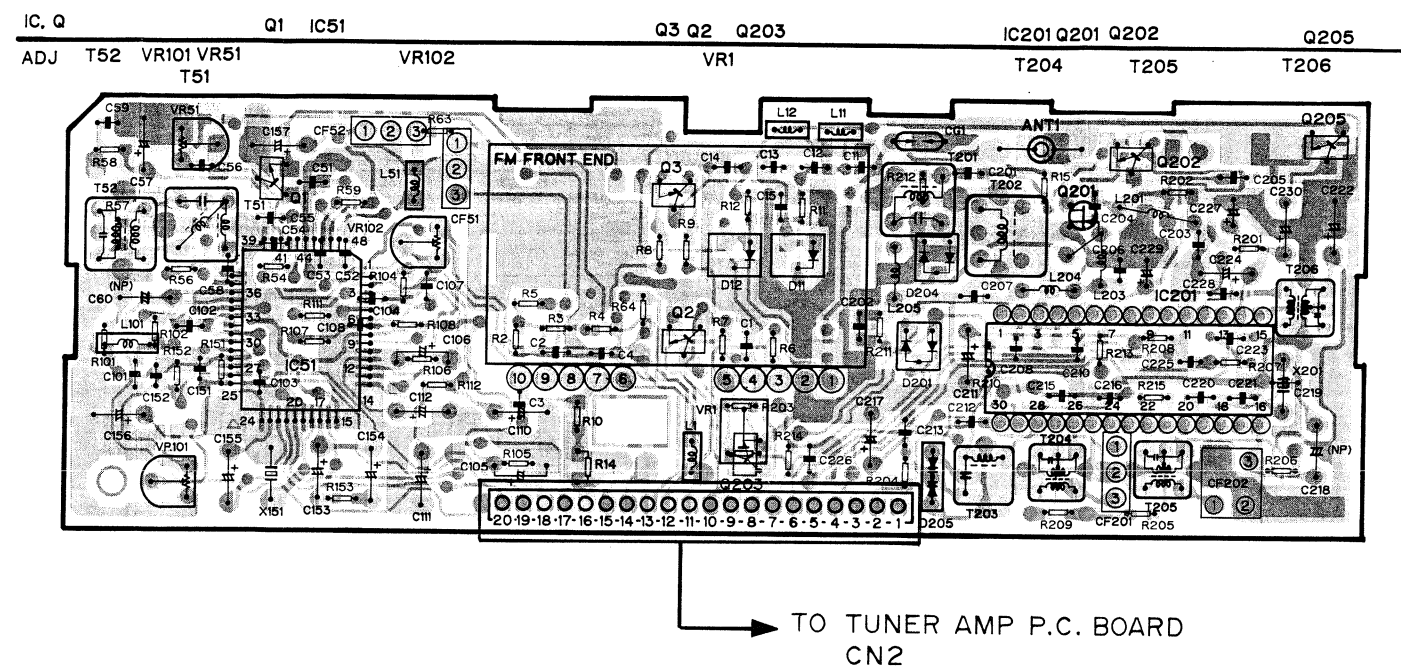
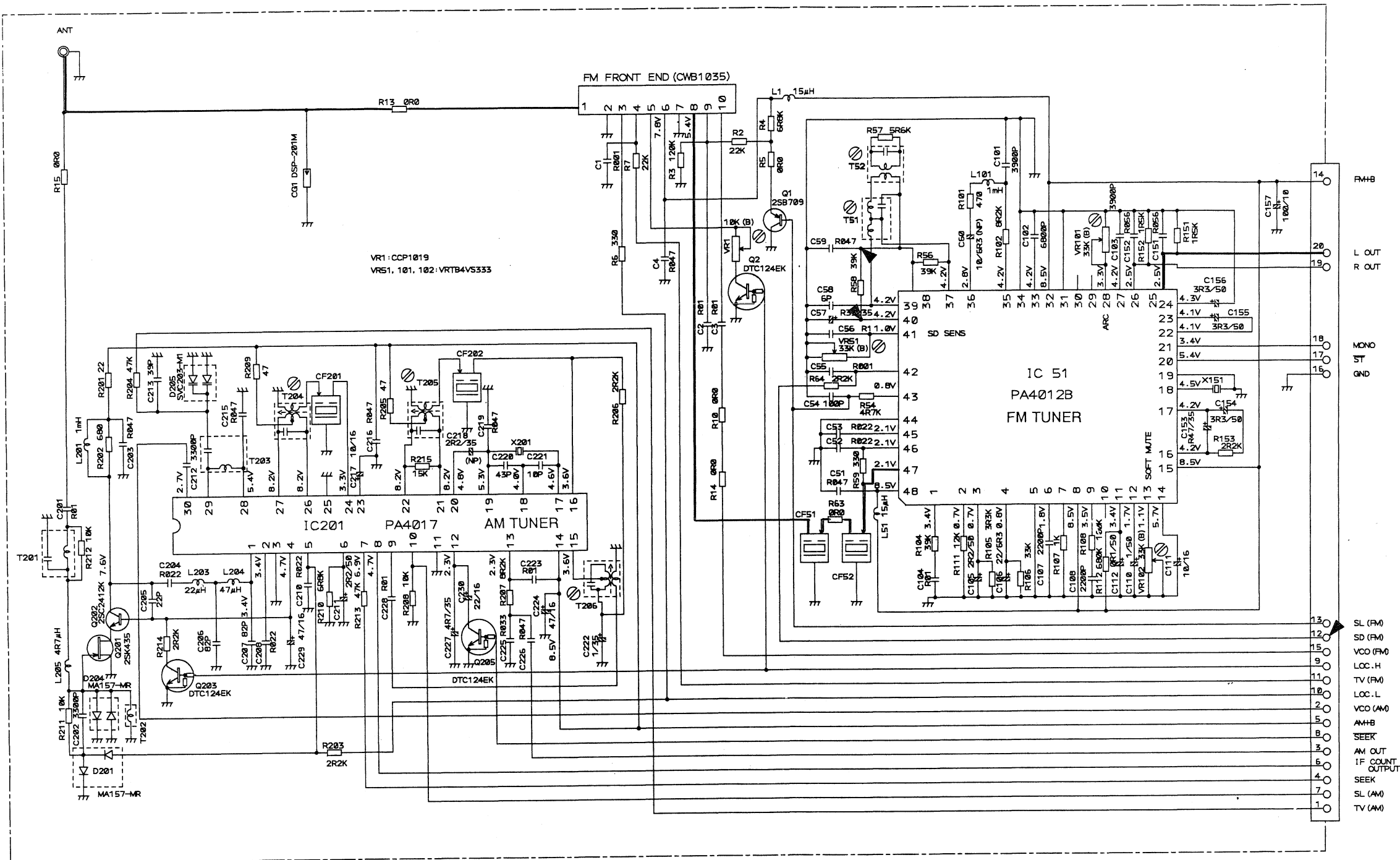


Fig. 20

● KEH-M8250/ES (FM/AM TUNER UNIT)

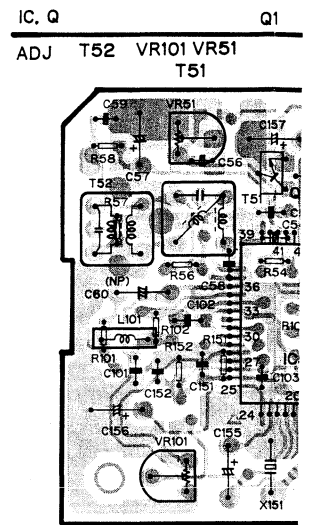


NOTE:

- Symbol indicates a resistor.  
No differentiation is made between chip resistors and discrete resistors.
- |— Symbol indicates a capacitor.  
No differentiation is made between chip capacitors and discrete capacitors.

Decimal points for resistor and capacitor fixed values are expressed as:  
2.2→2R2  
0.022→R022

Fig. 21





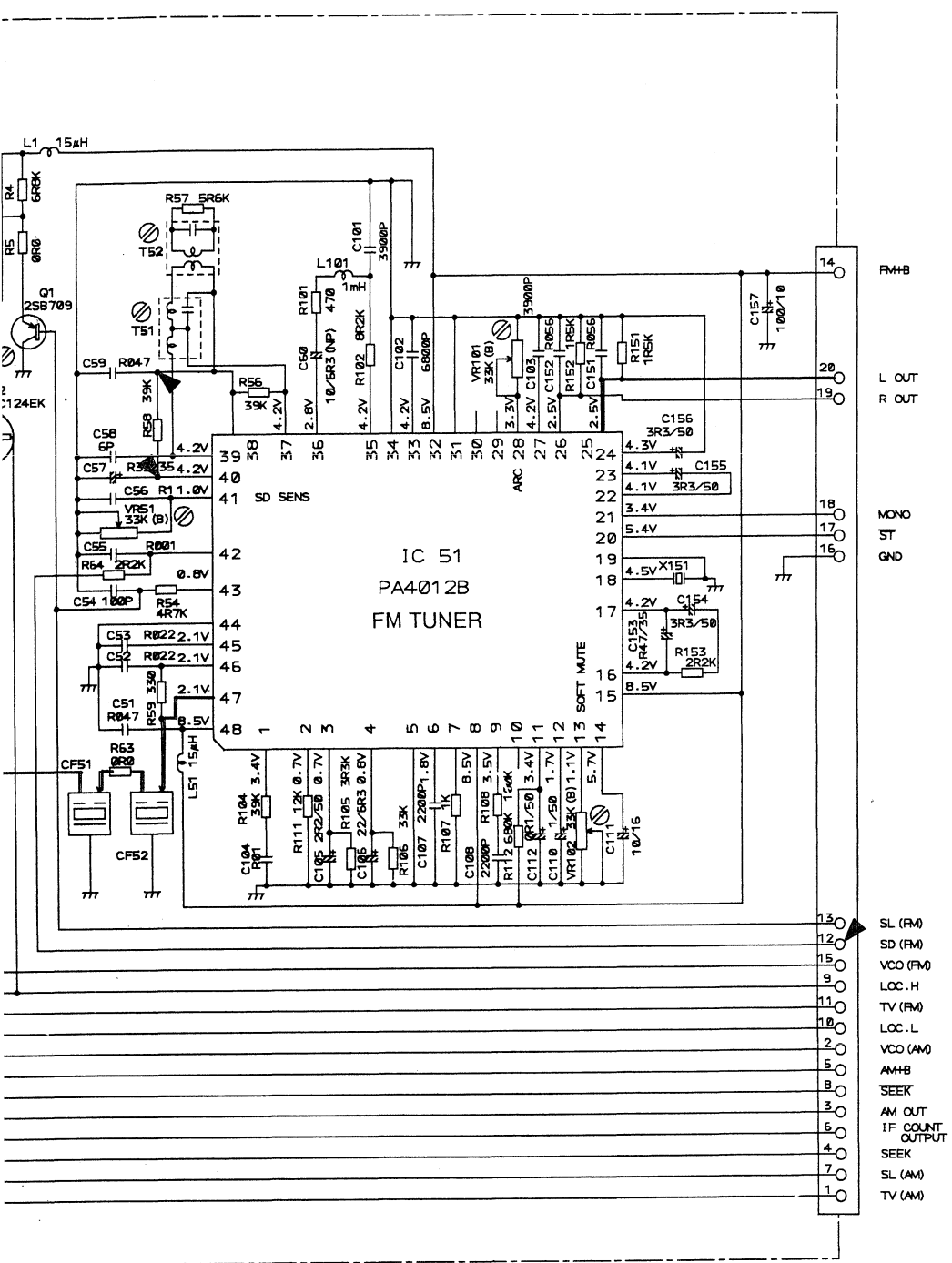


Fig. 21

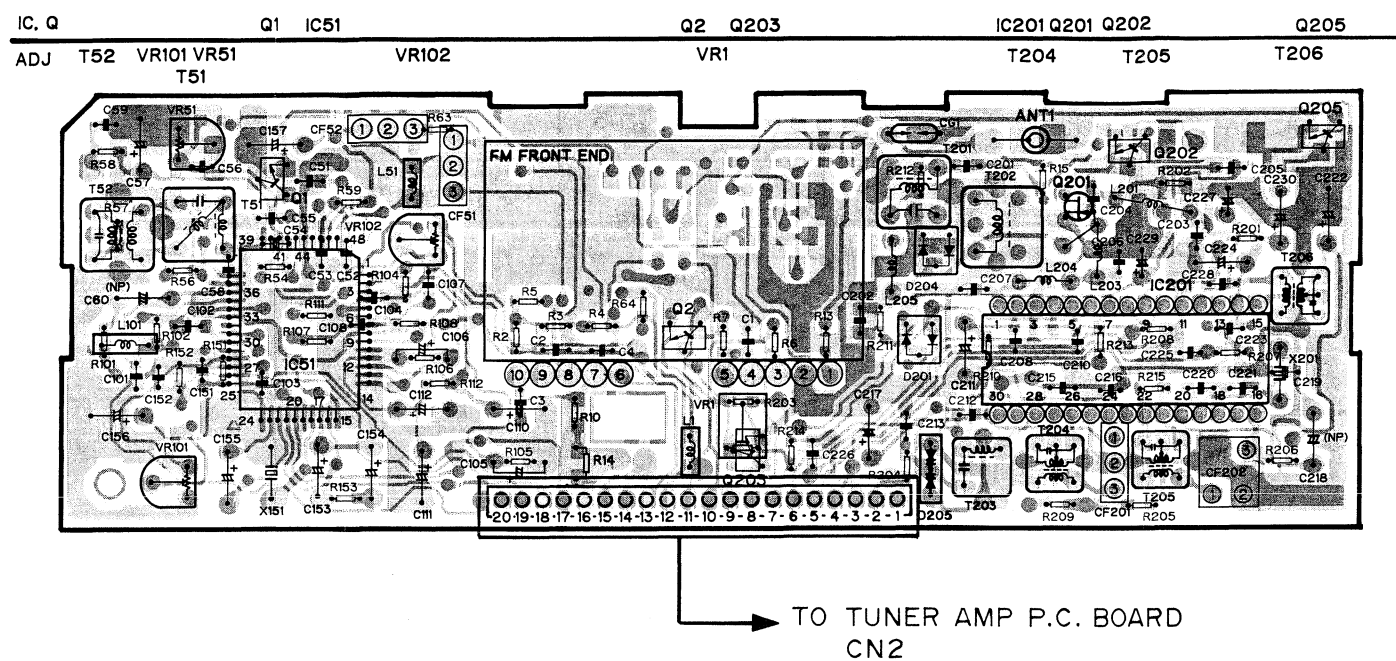


Fig. 22

A

B

C

D

14. CABINET EXPLODED VIEW

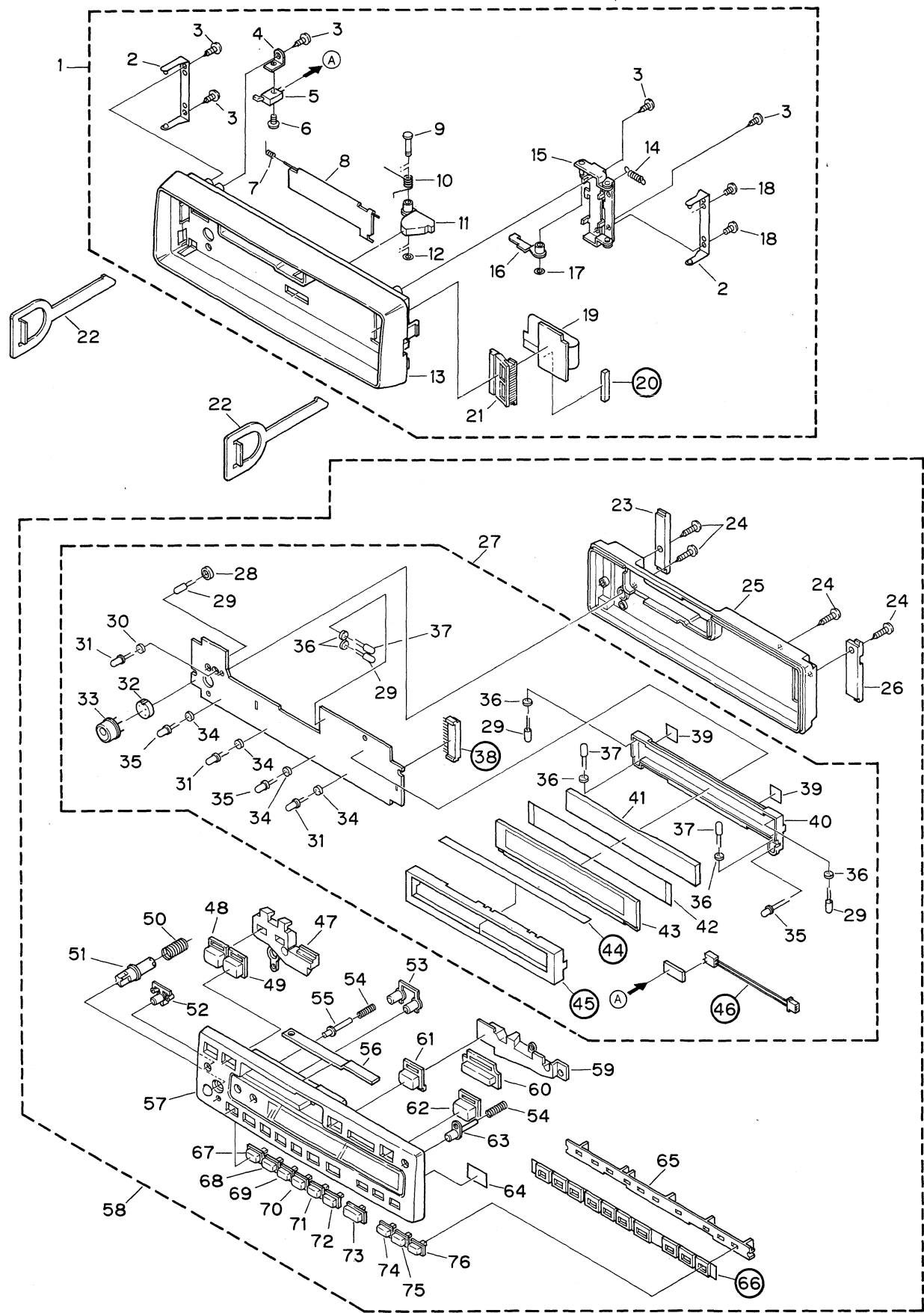


Fig. 23

NOTE:

- The parts marked with "●" may need long time to supply and their supply is subject to refuse as the case may be.
- Because the parts with encircled number shown on the dismantling drawing are not spare parts, we are unable to supply them in principle.

● Parts List (KEH-M650/US)

Mark No.	Description	Part No.	Mark No.	Description	Part No.
1	Panel Assy	CXA4070	41	Lens	CNV2673
2	Holder Unit	CXA4354	42	Half Mirror	CNM3131
3	Screw	BPZ20P060FMC	43	LCD	CAW1133
4	Holder	CNC3645	44	Insulator	CNM2986
5	Switch	CSN1007	45	Holder	CNC3559
6	Screw	CBA-172	46	Connector	CDE3330
7	Spring	CBH1350	47	Lens	CNV2674
8	Door	CAT1357	48	Button (VOLUME -)	CAC2799
9	Shaft	CLA1878	49	Button (VOLUME +)	CAC2800
10	Spring	CBH1383	50	Spring	CBH1385
11	Arm	CNV2670	51	Knob (FADER)	CAA1249
12	Washer	CBF1038	52	Button (SHIFT)	CAC2798
13	Panel	CNS2143	53	Button (LOUD/CLOCK)	CAC2794
14	Spring	CBH1395	54	Spring	CBH1384
15	Holder Unit	CXA3834	55	Button (RESET)	CAC2793
16	Arm Unit	CXA3868	56	Spacer	CNC3560
17	Washer	CBF1037	57	Grille Unit	CXA4294
18	Screw	PMZ20P030FMC	58	Grille Assy	CXA4071
19	P.C. Board	CNP2580	59	Lens	CNV2676
20	Spacer	CNM3063	60	Button (MS)	CAC2796
21	Socket	CKS1664	61	Button (EJECT)	CAC2795
22	Handle	CNC3664	62	Button (SOURCE)	CAC2797
23	Stopper	CNR1191	63	Button (DETACH)	CAC2791
24	Screw	BPZ20P120FZK	64	Film	CNM3080
25	Cover	CNS2142	65	Lens	CNV2675
26	Stopper	CNR1190	66	Cushion	CNM3031
● 27	Display Unit	CWS1206	67	Button (1)	CAC2801
28	Bush	CNV-724	68	Button (2)	CAC2802
29	Lamp	CEL-147	69	Button (3)	CAC2803
30	Spacer	CNW-662	70	Button (4)	CAC2804
31	Lamp	CEL1205	71	Button (5)	CAC2805
32	Spacer	CNW2734	72	Button (6)	CAC2806
33	IC	BX-1393	73	Button (BAND)	CAC2807
34	Spacer	CNW-805	74	Button (F1)	CAC2808
35	Lamp	CEL1204	75	Button (F2)	CAC2809
36	Spacer	CNV2761	76	Button (F3)	CAC2810
37	Lamp	CEL1025			
38	Plug	CKS2007			
39	Film	CNM3135			
40	Housing	CNV2671			

Mark 1

15. C

Mark 1



NOTE:  
The parts marked with “●” may need long time to supply and their supply is subject to refuse as the case may be.  
Because the parts with encircled number shown on the dismantling drawing are not spare parts, we are unable to supply them in principle.

Parts List (KEH-M650/US)

rk No.	Description	Part No.	Mark No.	Description	Part No.
1	Panel Assy	CXA4070	41	Lens	CNV2673
2	Holder Unit	CXA4354	42	Half Mirror	CNM3131
3	Screw	BPZ20P060FMC	43	LCD	CAW1133
4	Holder	CNC3645	44	Insulator	CNM2986
5	Switch	CSN1007	45	Holder	CNC3559
6	Screw	CBA-172	46	Connector	CDE3330
7	Spring	CBH1350	47	Lens	CNV2674
8	Door	CAT1357	48	Button(VOLUME -)	CAC2799
9	Shaft	CLA1878	49	Button(VOLUME +)	CAC2800
10	Spring	CBH1383	50	Spring	CBH1385
11	Arm	CNV2670	51	Knob(FADER)	CAA1249
12	Washer	CBF1038	52	Button(SHIFT)	CAC2798
13	Panel	CNS2143	53	Button(LOUD/CLOCK)	CAC2794
14	Spring	CBH1395	54	Spring	CBH1384
15	Holder Unit	CXA3834	55	Button(RESET)	CAC2793
16	Arm Unit	CXA3868	56	Spacer	CNC3560
17	Washer	CBF1037	57	Grille Unit	CXA4294
18	Screw	PMZ20P030FMC	58	Grille Assy	CXA4071
19	P.C. Board	CNP2580	59	Lens	CNV2676
20	Spacer	CNM3063	60	Button(MS)	CAC2796
21	Socket	CKS1664	61	Button(EJECT)	CAC2795
22	Handle	CNC3664	62	Button(SOURCE)	CAC2797
23	Stopper	CNR1191	63	Button(DETACH)	CAC2791
24	Screw	BPZ20P120FZK	64	Film	CNM3080
25	Cover	CNS2142	65	Lens	CNV2675
26	Stopper	CNR1190	66	Cushion	CNM3031
● 27	Display Unit	CWS1206	67	Button(1)	CAC2801
28	Bush	CNV-724	68	Button(2)	CAC2802
29	Lamp	CEL-147	69	Button(3)	CAC2803
30	Spacer	CNW-662	70	Button(4)	CAC2804
31	Lamp	CEL1205	71	Button(5)	CAC2805
32	Spacer	CNW2734	72	Button(6)	CAC2806
33	IC	BX-1393	73	Button(BAND)	CAC2807
34	Spacer	CNW-805	74	Button(F1)	CAC2808
35	Lamp	CEL1204	75	Button(F2)	CAC2809
36	Spacer	CNV2761	76	Button(F3)	CAC2810
37	Lamp	CEL1025			
38	Plug	CKS2007			
39	Film	CNM3135			
40	Housing	CNV2671			

Mark No.	Description	KEH-M650/US	KEH-M8200/US	KEH-M8250/CA	KEH-M8250/ES
		Part No.	Part No.	Part No.	Part No.
1	Panel Assy	CXA4070	CXA4070	CXA4070	CXA4073
8	Door	CAT1357	CAT1357	CAT1357	CAT1379
57	Grille Unit	CXA4294	CXA4295	CXA4297	CXA4296
58	Grille Assy	CXA4071	CXA4068	CXA4077	CXA4074
60	Button(MS)	CAC2796	CAC2796	CAC2796	CAC2906

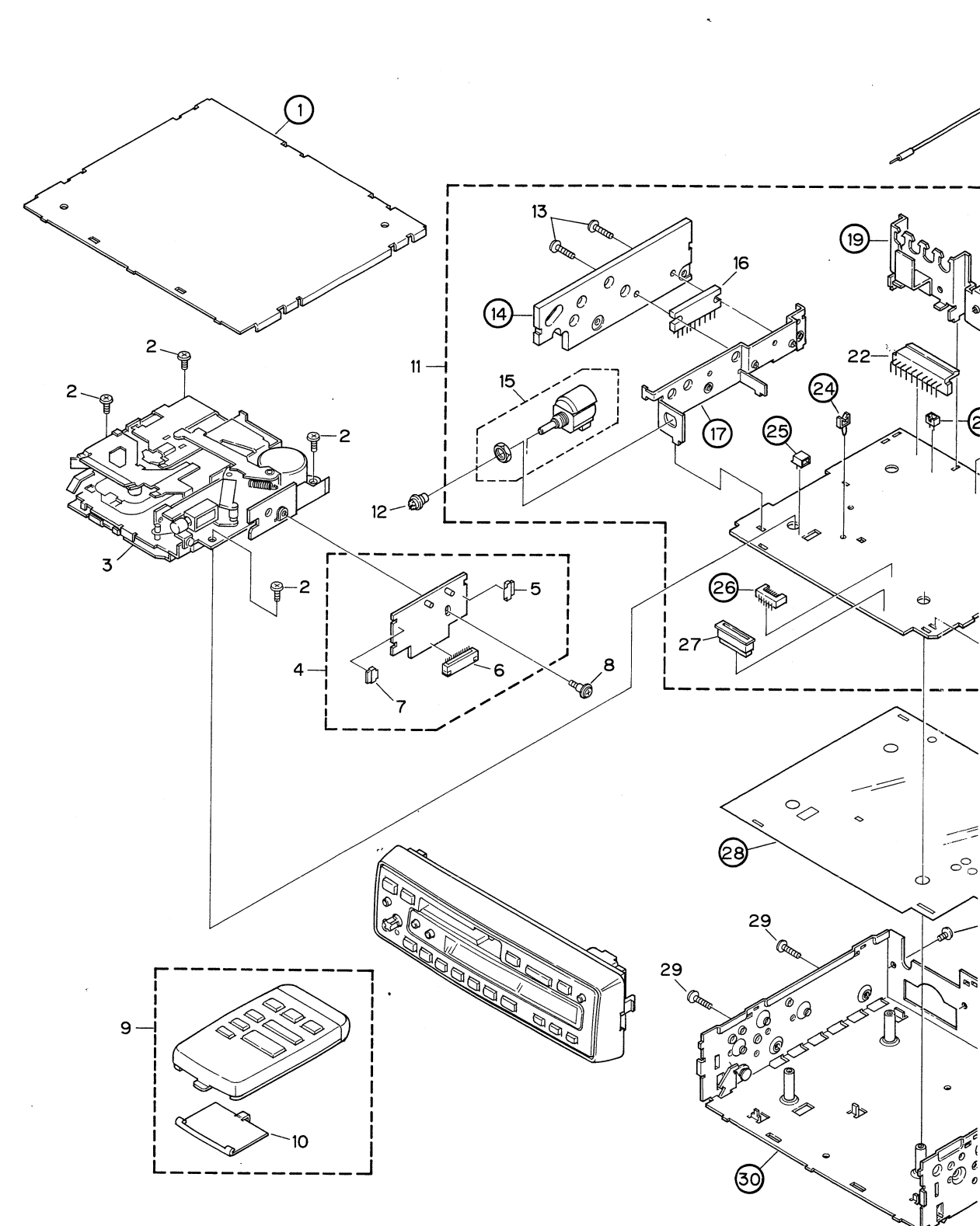
15. CHASSIS EXPLODED VIEW

Mark No.	Description	KEH-M650/US	KEH-M8200/US	KEH-M8250/CA	KEH-M8250/ES
		Part No.	Part No.	Part No.	Part No.
● 3	Cassette Mechanism Assy	EXK1460	EXK1450	EXK1460	EXK1450
● 4	Deck Unit	CWM2178	CWM2176	CWM2178	CWM2175
9	Remote Control Assy	CXA4105	CXA4106	CXA4106	CXA4107
● 11	Tuner Amp Unit	CWM2617	CWM2617	CWM2617	CWM2618
18	Cord	CDE3292	CDE3292	CDE3292	.....
34	Connector	CDE3106	CDE3104	CDE3106	CDE3104
35	Connector	CDE3105	CDE3103	CDE3105	CDE3103
36	Cap	CNV2680	CNW-829	CNW-829	CNW-829
● 46	FM/AM Tuner Unit	CWE1225	CWE1225	CWE1225	CWE1226

● Parts List (KEH-M650/US)

Mark No.	Description	Part No.	Mark No.	Description	Part No.
1	Case	CNB1430	30	Chassis Unit	CXA3832
2	Screw	BMZ26P050FMC	31	Bush	CNV1009
● 3	Cassette Mechanism Assy	EXK1460	32	Screw	CBA1002
● 4	Deck Unit	CWM2178	33	Holder	CNC3565
			34	Connector	CDE3106
5	Connector	CKS1773	35	Connector	CDE3105
6	Connector	CKS1710	36	Cap	CNV2680
7	Connector	CKS1771	37	Holder	CNC3566
8	Screw	CBA1142	38	Plug	CKS1224
9	Remote Control Assy	CXA4105	39	Plug	CKS-568
10	Battery Cover	CNS2224	40	Connector	CKS1993
● 11	Tuner Amp Unit	CWM2617	41	Connector	CKS1990
12	Knob	CAA1250	42	Plug	CKS1982
13	Screw	BMZ30P140FMC	43	Plug	CKS1979
14	Heat Sink	CNC3562	44	Plug	CKS1315
15	Volume	CCS1187	45	Plug	CKS1729
16	IC	TA8215H-A	● 46	FM/AM Tuner Unit	CWE1225
17	Holder	CNC3563	47	Insulator	CNM2105
18	Cord	CDE3292	48	Antenna Jack	CKX1010
19	Holder	CNC3564	49	FM Front End	CWB1035
20	Screw	BMZ30P050FMC	50	Plug	CKS1628
21	IC	TA8214K	51	Holder	CNC3395
22	Plug	CKS-467	52	DIN Connector Cord	CDE3107
23	Plug	CKS1299	53	Antenna Cable	CDH1093
24	Clamper	CNV1335	54	Cord Assy	CDE3111
25	Plug	CKS1049	55	Resistor	RS1/2P102JL
26	Plug	CKS1318	56	Cap	CNS1472
27	Plug	CKS1881	57	Case	CNS2269
28	Insulator	CNM2931	58	Holder	CNC3342
29	Screw	BMZ30P100FMC			

● Chassis



● Chassis

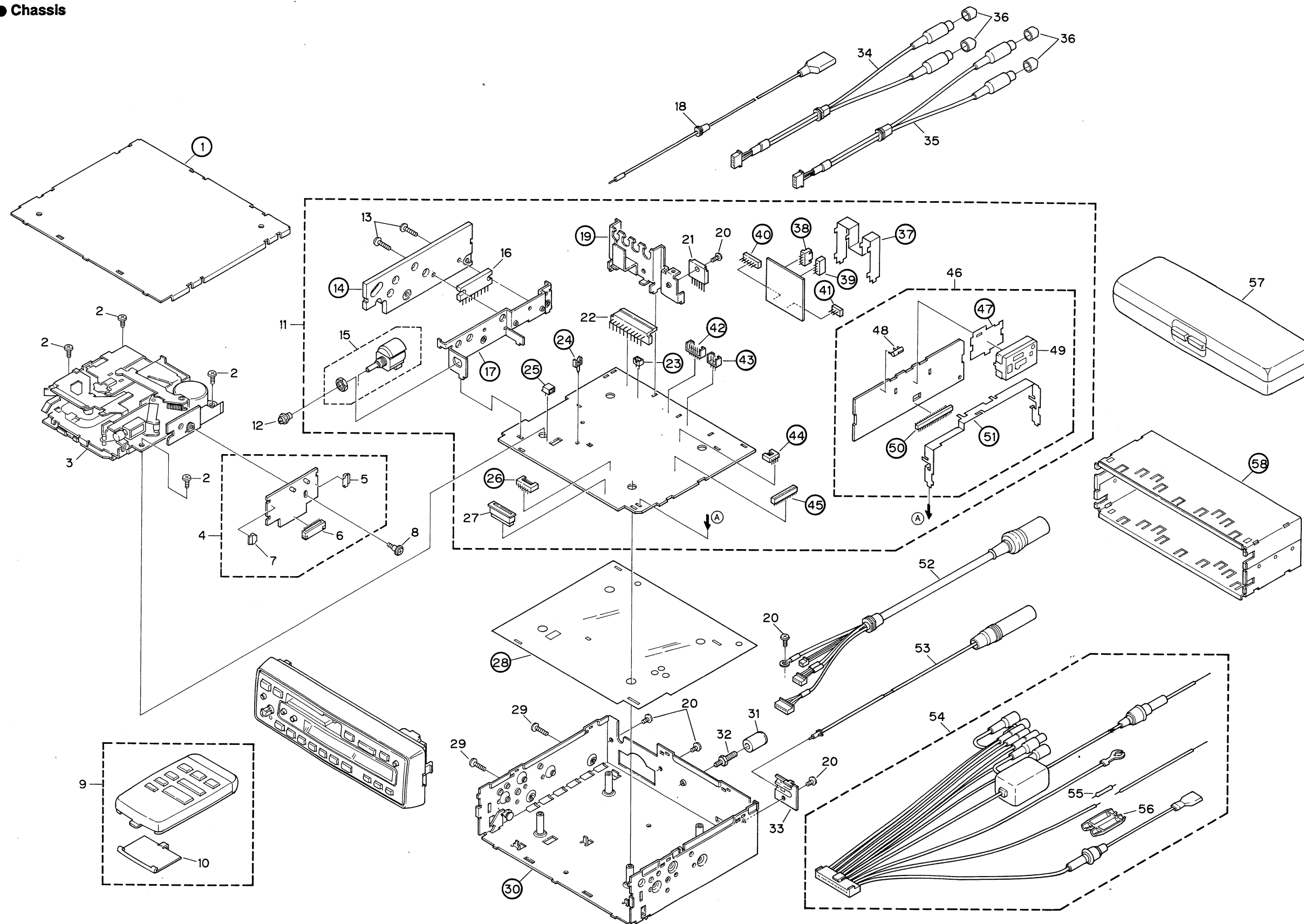


Fig. 24

## 16. CASSETTE MECHANISM ASSY EXPLODED VIEW

● Parts

Mark N

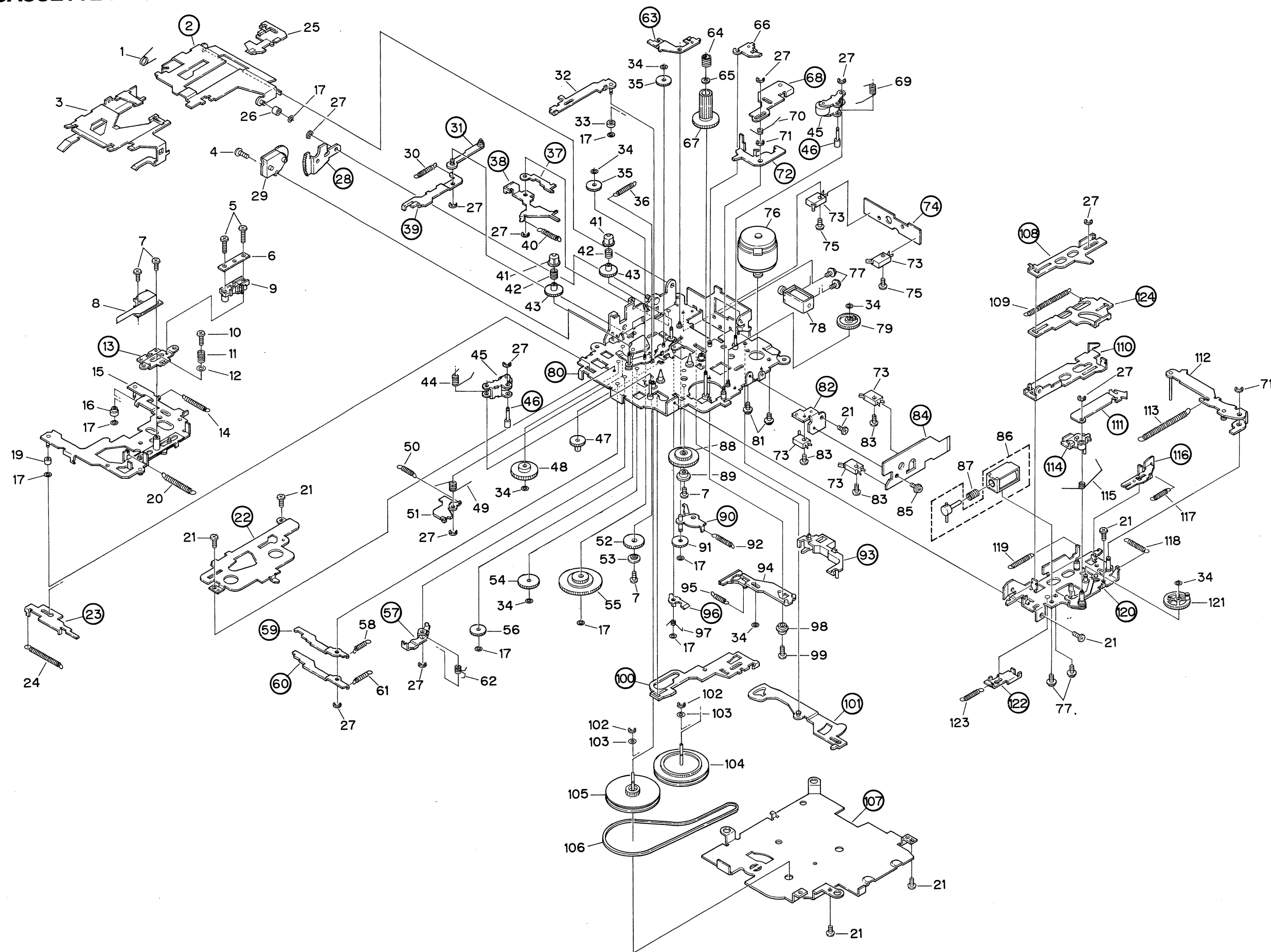


Fig. 25

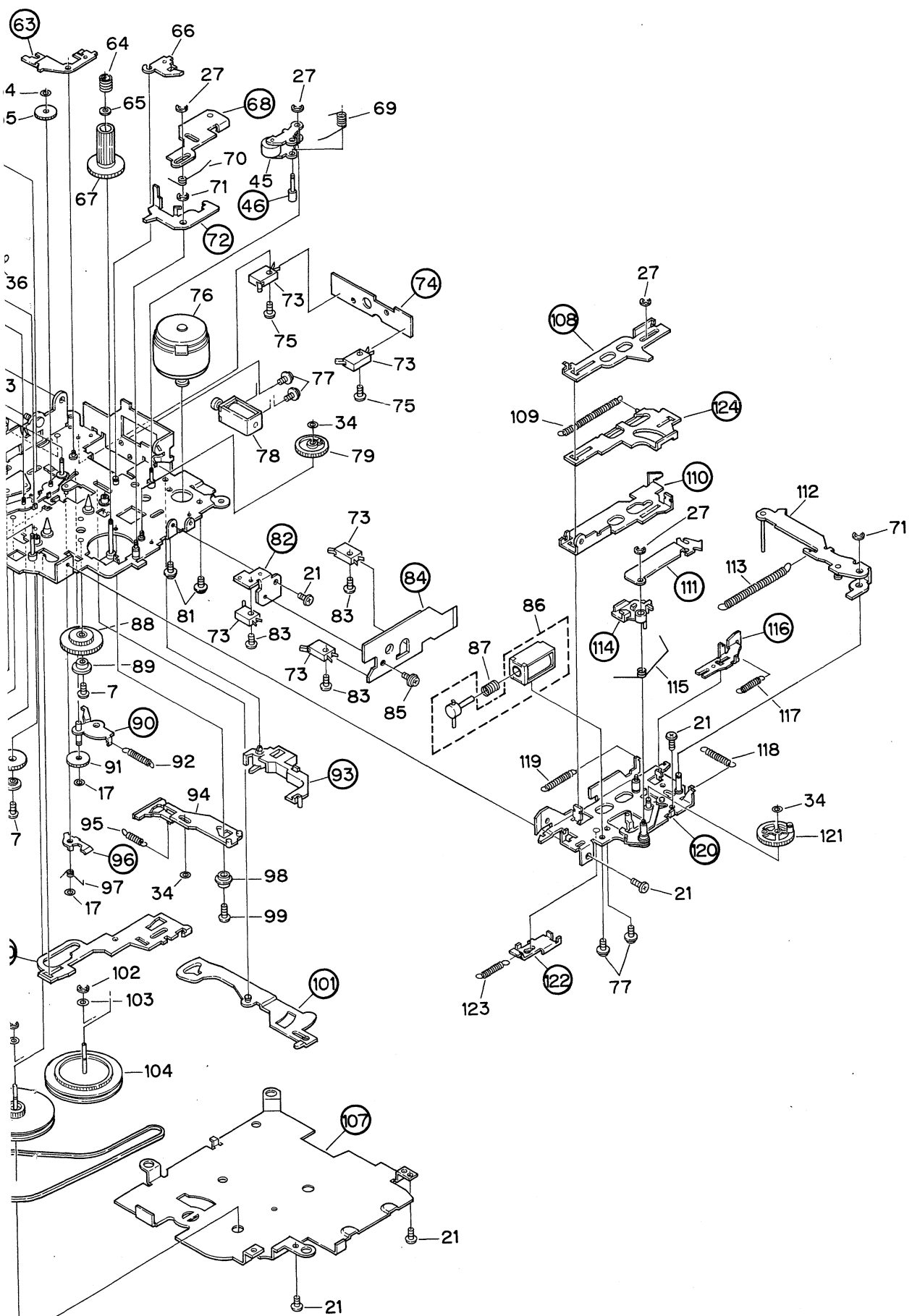


Fig. 25

# ● Parts List

Mark No.	Description	Part No.	Mark No.	Description	Part No.
A	1 Spring	EBH1121	38 Arm	ENC1148	
	2 Arm Unit	EXA1132	39 Arm	ENC1147	
	3 Cassette Holder	ENC1165	40 Spring	EBH1186	
	4 Screw	CBA1070	41 Collar	ENV1117	
	5 Screw	EBA1016	42 Spring	EBH1155	
B	6 Spring	EBL1011	43 Gear	ENV1116	
	7 Screw	HBA-175	44 Spring	EBH1190	
	8 Head Unit (KEH-M650/US, KEH-M8250/CA)	EXA1087	45 Pinch Roller Unit	EXA1043	
			46 Shaft	ELA1129	
			47 Gear	ENV1113	
C	Head Unit (KEH-M8200/US, KEH-M8250/ES)	EXA1084	48 Gear	ENV1111	
	9 Spacer	ENV1136	49 Spring	EBH1138	
	10 Screw	BMZ20P025FMC	50 Spring	EBH1142	
	11 Spring	EBH1145	51 Arm	ENV1138	
	12 Washer	EBE1005	52 Gear	ENV1109	
D	13 Arm	ENC1155	53 Collar	ELA1161	
	14 Spring	EBH1187	54 Gear	ENV1110	
	15 Head Base Unit	EXA1115	55 Gear Unit	EXA1083	
	16 Roller	ELA1147	56 Gear	ENV1112	
	17 Washer	CBF1037	57 Arm Unit	EXA1075	
E	18 .....		58 Spring	EBH2002	
	19 Roller	ELA1146	59 Arm	ENC1152	
	20 Spring	EBH1131	60 Arm	ENC1151	
	21 Screw	BMZ20P030FMC	61 Spring	EBH1136	
	22 Cover	ENC1166	62 Spring	EBH2003	
F	23 Lever	ENC1159	63 Arm	ENC1149	
	24 Spring	EBH1183	64 Spring	EBH1182	
	25 Lever	ENV1124	65 Washer	HBF-120	
	26 Roller	ELA1148	66 Arm	ENV1121	
	27 Washer	YE15FUC	67 Gear	ENV1142	
G	28 Arm	ENC1174	68 Lever Unit	EXA1078	
	29 Damper Unit	CXA3242	69 Spring	EBH1189	
	30 Spring	EBH2007	70 Spring	EBH1153	
	31 Lever Unit	EXA1079	71 Washer	YE20FUC	
	32 Lever Unit	EXA1074	72 Arm	ENC1150	
H	33 Roller	ELA1149	73 Switch	CSN1005	
	34 Washer	CBF1038	74 P.C. Board	ENP1023	
	35 Gear	ENV1134	75 Screw	CBA-172	
	36 Spring	EBH1139	76 Motor Unit	EXA1089	
	37 Arm	ENC1170	77 Screw	PMS20P022FUC	

Mark No.	Description	Part No.	Mark No.	Description	Part No.
78	Solenoid	EXP1009	103	Washer	HBF-179
79	Gear	ENV1106	104	Flywheel	ENV1128
80	Chassis Unit	EXA1131	105	Flywheel	ENV1127
81	Screw	PMS20P025FMC	106	Belt	ENT1014
82	Bracket	ENC1163	107	Cover	ENC1167
83	Screw	CBA1070	108	Lever	ENC1164
84	P.C. Board	ENP1021	109	Spring	EBH1147
85	Screw	CBA1076	110	Lever	ENC1160
86	Solenoid	EXP1004	111	Arm	ENC1156
87	Spring	EBH1157	112	Arm Unit	EXA1111
88	Gear	ENV1108	113	Spring	EBH1135
89	Collar	ELA1151	114	Clamper	ENV1141
90	Arm Unit	EXA1076	115	Spring	EBH1151
91	Gear	ENV1114	116	Lever	ENC1171
92	Spring	EBH1141	117	Spring	EBH1149
93	Clamper	ENV1140	118	Spring	EBH1146
94	Arm Unit	EXA1090	119	Spring	EBH1148
95	Spring	EBH1169	120	Guide Unit	EXA1100
96	Arm	ENC1153	121	Gear	ENV1118
97	Spring	EBH1140	122	Arm	ENC1157
98	Collar	ELA1162	123	Spring	EBH1158
99	Screw	JFZ20P045FNI	124	Lever	ENC1161
100	Lever	ENC1158			
101	Arm Unit	EXA1099			
102	E Type Washer	CBG1003			



## 17. PACKING METHOD

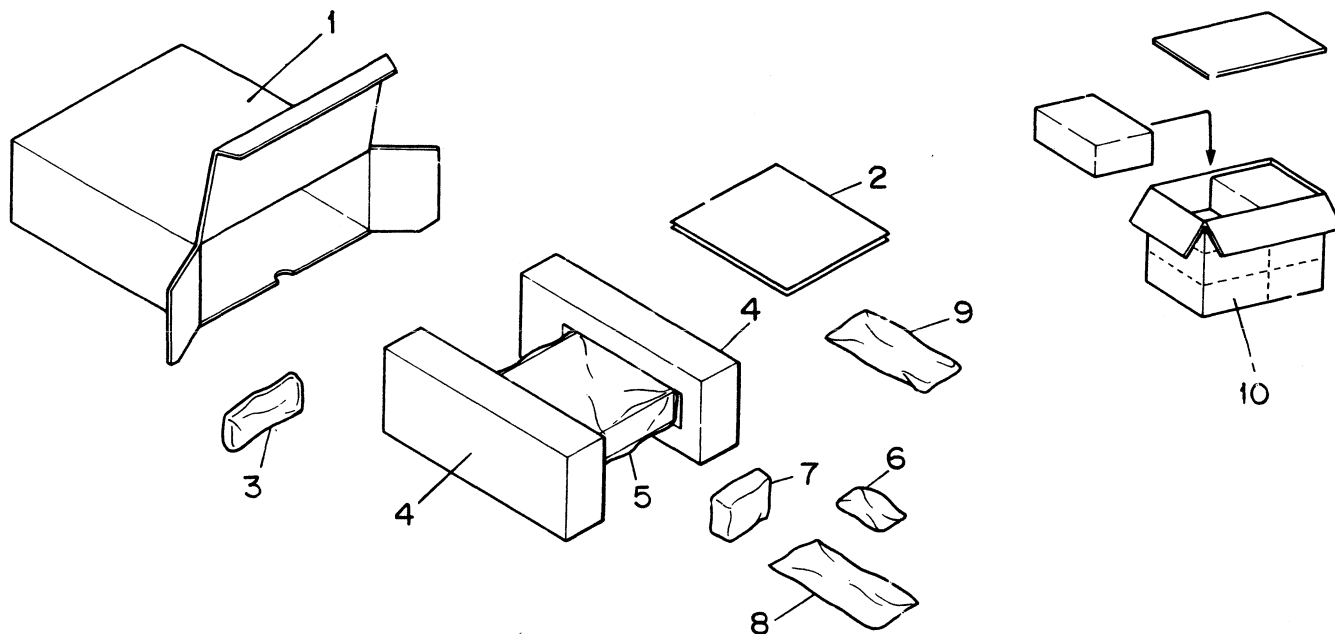


Fig. 26

**NOTE:**

- Parts whose parts numbers are omitted are subject to being not supplied.

**● Parts List (KEH-M650/US)**

Mark No.	Description	Part No.	Mark No.	Description	Part No.
1	Carton	CHG1970	8	Case	CNS2269
2-1	Owner's Manual	CRB1215	9	Accessory Assy	CEA1633
2-2	Card		9-1	Screw (× 1)	CBA-102
2-3	Caution Card		9-2	Screw (× 1)	CBA1002
3	Cord Assy	CDE3111	9-3	Cord	CDE1289
4	Styrofoam	CHP1351	9-4	Handle (× 2)	CNC3664
5	Cover	CEG1092	9-5	Strap	CNF-111
6	Accessory Assy	CEA1473	9-6	Bush	CNV1009
6-1	Fastener (Rough)	CNM1716	9-7	Nut (× 2)	NF50FMC
6-2	Fastener (Soft)	CNM1717	10	Contain Box	CHL1970
6-3	Battery				
7	Remote Control Assy	CXA4105			
7-1	Battery Cover	CNS2224			

Mark No.	Description	KEH-M650 /US	KEH-M8200 /US	KEH-M8250 /CA	KEH-M8250 /ES
		Part No.	Part No.	Part No.	Part No.
1	Carton	CHG1970	CHG1969	CHG1971	CHG1972
* 2-1	Owner's Manual	CRB1215	CRB1214	CRD1465	CRD1466
2-2	Card				
9	Contain Box	CHL1970	CHL1969	CHL1971	CHL1972

\* 2-1 Owner's Manual

Part No.	Model	Language
CRB1215	KEH-M650/US	English
CRB1214	KEH-M8200/US	English
CRD1465	KEH-M8250/CA	English, French
CRD1466	KEH-M8250/ES	English, French, Spanish, Arabic

## 18. ELECTRICAL PARTS LIST

### NOTE:

- Parts whose parts numbers are omitted are subject to being not supplied.
- The part numbers shown below indicate chip components.

Chip Resistor

RS1/8S□□□J, RS1/10S□□□J

Chip Capacitor (except for CQS.....)

CKS....., CCS....., CSZS.....

Unit Number :

Unit Name : FM/AM Tuner Unit (KEH-M650/US, KEH-M8200/US, KEH-M8250/CA)

### MISCELLANEOUS

Mark	====	Circuit Symbol & No.	====	Part Name	Part No.	Mark	====	Circuit Symbol & No.	====	Part Name	Part No.
IC	51				PA4012B	T	201	Coil		CTB1020	
IC	201				PA4017	T	202	Coil		CTB1004	
Q	1			Chip Transistor	2SB709	T	203	Coil		CTB1040	
Q	2			Chip Transistor	DTC124EK	T	204	Coil		CTE1037	
Q	3			Chip Transistor	2SA1162	T	205	Coil		CTE1038	
Q	201				2SK435	T	206	Coil		CTE1039	
Q	202				2SC2412K	CG	1	Surge Protector		DSP-201M	
Q	203	205		Chip Transistor	DTC124EK	CF	51 52	Ceramic Filter		CTF-182	
D	11	12		Chip Diode	1SV128A-BB	CF	201	Ceramic Filter		CTF1041	
D	201	204		Chip Diode	MA157-MR	CF	202	Filter		CTF1085	
D	205				SVC203-M1	X	151	Ceramic Resonator		CSS1055	
L	1	51		Inductor	CTF1241	X	201	Crystal Resonator		CSS1014	
L	11	12		Inductor	CTF1065	VR	1	Semi-fixed 100kΩ (B)		CCP1025	
L	101			Inductor	CTF1170	VR	51 101 102	Semi-fixed 33kΩ (B)		VRTB4VS333	
L	201			Ferri-Inductor	CTF1026			FM Front End		CWB1035	
L	203			Ferri-Inductor	LAU220K						
L	204			Ferri-Inductor	LAU470K						
L	205			Ferri-Inductor	LAU4R7K						
T	51			Coil	CTE1021						
T	52			Coil	CTE1022						

## RESISTORS

Mark	====	Circuit Symbol & No.	====	Part Name	Part No.
R	2	7			RS1/10S223J
R	3				RS1/10S683J
R	4				RS1/10S682J
R	5	63			RS1/10S0R0J
R	6	59			RS1/10S331J
R	8				RS1/10S331J
R	9	58			RS1/10S223J
R	10	14			RS1/10S0R0J
R	11				RS1/10S104J
R	12				RS1/10S470J
R	15				RS1/10S0R0J
R	54				RS1/10S472J
R	56	104			RS1/10S393J
R	57				RS1/10S562J
R	64				RS1/10S222J
R	101				RS1/10S471J
R	102				RS1/10S822J
R	105				RS1/10S332J
R	106				RS1/10S333J
R	107				RS1/10S102J
R	108				RS1/10S104J
R	111				RS1/10S123J
R	112				RS1/10S684J
R	151	152			RS1/10S152J
R	153				RS1/10S222J
R	201				RS1/10S220J
R	202				RS1/10S681J
R	203	206 214			RS1/10S222J
R	204	213			RS1/10S473J
R	205	209			RS1/10S470J
R	207				RS1/10S822J
R	208	211 212			RS1/10S103J
R	210				RS1/10S682J
R	215				RS1/10S153J

## CAPACITORS

Mark	====	Circuit Symbol & No.	====	Part Name	Part No.
C	1				CKSQYB102K50
C	2	3 104			CKSQYB103K50
C	4	59			CKSQYF473225
C	11	12 13 14			CCSQCH220J50
C	15				CKSQYB223K25
C	51				CKSQYF473225
C	52	53			CKSQYB223K25
C	54				CCSQSL101J50
C	55				CKSQYB102K50
C	56				CKSQYF104Z25
C	57				CEAR68M50LS2
C	58				CCSQCH060D50
C	60				CEALNP100M6R3
C	101				CKSQYB392K50
C	102				CKSQYB682K50
C	103				CKSQYB392K50
C	105				CEA2R2M50LL
C	106				CEA220M6R3LL
C	107	108			CKSQYB222K50
C	110				CEA010M50LL
C	111				CEA100M16LL
C	112				CEA0R1M50LL
C	151	152			CKSQYB563K25
C	153				CSZAR47M35L
C	154	155 156			CEA3R3M50LL

Mark	====	Circuit Symbol & No.	====	Part Name	Part No.
C	157				CEA101M10LS
C	201 223 228				CKSQYB103K25
C	202 212				CKSQYB332K50
C	203 215 216 219 226				CKSQYF473225
C	204 208 210				CKSQYB223K25
C	205				CCSQCH220J50
C	206 207				CCSQCH820J50
C	211				CEA2R2M50LL
C	213				CCSQCH390J50
C	217				CEA100M16LL
C	218				CEA2R2M35NPLL
C	220				CCSQCH430J50
C	221				CCSQCH100D50
C	222				CSZA010K35L
C	224				CEA470M16LL
C	225				CKSQYB333K25
C	227				CEA4R7M35LS
C	229				CEA470M16LS
C	230				CEA220M16LL

FM/AM Tuner Unit		KEH-M650/US KEH-M8200/US KEH-M8250/CA	KEH-M8250/ES
Mark	Circuit Symbol & No.	Part No.	Part No.
Q3		2SA1162	.....
D11, 12		1SV128A-BB	.....
L11, 12 Inductor		CTF1065	.....
L101 Inductor		CTF1170	CTF1126
VR1 Semi-fixed		CCP1025 100kΩ (B)	CCP1019 10kΩ (B)
R3		RS1/10S683J	RS1/10S124J
R8		RS1/10S331J	.....
R9		RS1/10S223J	.....
R11		RS1/10S104J	.....
R12		RS1/10S470J	.....
R13		.....	RS1/10S0R0J
R58		RS1/10S223J	RS1/10S393J
C11, 12, 13, 14		CCSQCH220J50	.....
C15		CKSQYB223K25	.....
C57		CEAR68M50LS2	CSZAR33K35

Unit Number :

Unit Name : Deck Unit (KEH-M650/US, KEH-M8250/CA)

## MISCELLANEOUS

Mark	====	Circuit Symbol & No.	====	Part Name	Part No.
IC	251				BA3430FS
IC	301				HA12161FP
Q	251 281		Chip Transistor		2SC4116
Q	282 284 286		Chip Transistor		2SB1441JU
Q	283 285		Chip Transistor		2SC3295
Q	301				FMG9
VR	301 302		Semi-fixed 33kΩ (B)		CCP1076

## RESISTORS

Mark	====	Circuit Symbol & No.	====	Part Name	Part No.
R	251 252 253 254				RS1/10S273J
R	255 256 401				RS1/10S181J
R	257 258				RS1/10S334J
R	259 260				RS1/10S133J
R	261 262				RS1/10S183J

Mark	====	Circuit Symbol & No.	====	Part Name	Part No.
R	263				RS1/10S473J
R	264				RS1/10S333J
R	265	266			RS1/10S224J
R	281				RS1/10S472J
R	282	288 293			RS1/10S473J
R	283	284 285 289 290 294 295			RS1/8S221J
R	286	291 296			RS1/10S103J
R	287	292 307			RS1/10S103J
R	301	302 306 308			RS1/10S223J
R	303	304			RS1/10S561J
R	305				RS1/10S183J
R	309				RS1/10S682J
R	402				RS1/10S270J
R	403				RS1/10S823J

## CAPACITORS

Mark	====	Circuit Symbol & No.	====	Part Name	Part No.
C	251	252 253 254			CCSQCH331J50
C	255	256	22 $\mu$ F/6.3V		CCH1065
C	257	258			CKSQYB103K50
C	259	260 313	1 $\mu$ F/50V		CCH1072
C	261		100 $\mu$ F/6.3V		CCH1067
C	262				CKSYB103K50
C	281	282	4.7 $\mu$ F/25V		CCH1064
C	301	302	0.47 $\mu$ F/50V		CCH1073
C	303	304 305 306 307 308			CKSQYB222J50
C	309	310 311 312			CKSYB104K25
C	314				CKSYB103K50
C	401				CKSQYB152K50
C	402	404			CKSYB104K25
C	403		6.8 $\mu$ F/25V		CCH1066

Deck Unit	KEH-M8200/US KEH-M8250/CA	KEH-M8200/US
Mark	Circuit Symbol & No.	Part No.
	R251, 252, 253, 254	RS1/10S273J
	C251, 252, 253, 254	CCSQCH331J50

Unit Number :  
Unit Name : Deck Unit(KEH-M8250/ES)

## MISCELLANEOUS

Mark	====	Circuit Symbol & No.	====	Part Name	Part No.
IC	251				BA3430FS
IC	301				HA12134FP
Q	251	281	Chip Transistor		2SC4116
Q	282	284 286	Chip Transistor		2SB1441JU
Q	283	285	Chip Transistor		2SC3295
Q	301				DTC143EK
VR	301	302	Semi-fixed 33k $\Omega$ (B)		CCP1076

## RESISTORS

Mark	====	Circuit Symbol & No.	====	Part Name	Part No.
R	251	252 253 254			RS1/10S104J
R	255	256 401			RS1/10S181J
R	257	258			RS1/10S334J
R	259	260			RS1/10S133J
R	261	262			RS1/10S183J

Mark	====	Circuit Symbol & No.	====	Part Name	Part No.
R	263				RS1/10S473J
R	264				RS1/10S333J
R	265	266			RS1/10S224J
R	281				RS1/10S472J
R	282	288 293			RS1/10S473J
R	283	284 285 289 290 294 295			RS1/8S221J
R	286	291 296			RS1/10S103J
R	287	292			RS1/10S103J
R	306	308			RS1/10S223J
R	305				RS1/10S183J
R	402				RS1/10S270J
R	403				RS1/10S823J

## CAPACITORS

Mark	====	Circuit Symbol & No.	====	Part Name	Part No.
C	251	252 253 254			CKSQYB681K50
C	255	256	22 $\mu$ F/6.3V		CCH1065
C	257	258			CKSQYB103K50
C	259	260 313	1 $\mu$ F/50V		CCH1072
C	261		100 $\mu$ F/6.3V		CCH1067
C	262				CKSYB103K50
C	281	282	4.7 $\mu$ F/25V		CCH1064
C	301	302	0.47 $\mu$ F/50V		CCH1073
C	314				CKSYB103K50
C	401				CKSQYB152K50
C	402	404			CKSYB104K25
C	403		6.8 $\mu$ F/25V		CCH1066

Unit Number :  
Unit Name : Tuner Amp Unit(KEH-M650/US, KEH-M8200/US, KEH-M8250/CA)

## MISCELLANEOUS

Mark	====	Circuit Symbol & No.	====	Part Name	Part No.
IC	401				PD4307A
IC	402				S-80734AN-DY
IC	501				LC7218M
IC	601				TA8214K
IC	701				RC4558MD
IC	702				UPC4570G
IC	707				HFE701F008X2
IC	801				TA8215H-A
IC	852	853			RC2068MD1
Q	401	402	Chip Transistor		2SA1162
Q	403	619	Chip Transistor		DTC114EK
Q	404		Chip Transistor		DTC144EK
Q	501				2SC2498
Q	502				DTC124ES
Q	503	504 506 703 704			2SC2458
Q	505				2SC3113
Q	507				2SK330
Q	601	603 608 616 622			2SB1243
Q	602	605 610 719	Chip Transistor		2SC2712
Q	604	609			DTC114ES
Q	611	618			2SD1859
Q	615				2SD2037
Q	617	712 723			DTC143ES
Q	620		Chip Transistor		2SA1036K
Q	621		Chip Transistor		DTC143EK

Mark	====	Circuit Symbol & No.	====	Part Name	Part No.
Q	623	631		Chip Transistor	DTC144EK
Q	624	625			2SB1243
Q	626			Chip Transistor	DTC143TK
Q	632				DTA143EK
Q	701	702	705 706		DTC343TS
Q	709	710	717 718	Chip Transistor	DTC343TK
Q	711				DTA114ES
Q	713			Chip Transistor	DTA143EK
Q	720			Chip Transistor	2SA1162
Q	721			Chip Transistor	DTC124EK
Q	722			Chip Transistor	DTA114EK
Q	853	854	855 856	Chip Transistor	DTC343TK
D	401	402	403 404	501 502 503 504 508	1SS176
D	506	613		Chip Diode	MA151WK-MT
D	509				RD3R0ESB2
D	601				ERC04-02
D	602				HZS7A1L
D	604	605	607		ERA15-02VH
D	606				HZS7C2L
D	608				HZS6B1L
D	611				HZS9C2L
D	612				HZS6C1L
D	701	703			1SS176
D	702				HZS5ALL
D	704			Chip Diode	MA151WA-MN
D	705				HZS9R1J83
D	706	852	853	Chip Diode	MA151WK-MT
L	401			Ferri-Inductor	LAU150K
L	402			Ferri-Inductor	LAU2R7K
L	501	502		Ferri-Inductor	LAU1R0M
L	503			Ferri-Inductor	LAU2R2M
L	601			Coil	CTF1135
L	602	603		Ferri-Inductor	CTF1202
TC	401			Trimmer	CCG1002
IB	401				CWW1329
IB	402				CWW1147
IB	403				CWW1322
IB	404				CWW1323
IB	405				CWW1306
IB	406				CWW1302
IB	407				CWW1301
IB	408				CWW1321
X	401			Crystal Resonator	CSS1023
X	501			Crystal Resonator	CSS1030
SW	401			Switch	CSG1020
VR	801			Volume 200Ω (P)	CCS1187
EF	601			EMI Filter	CCG1006
BZ	401			Buzzer	CPV1012
				FM/AM Tuner Unit	

## RESISTORS

Mark	====	Circuit Symbol & No.	====	Part Name	Part No.
R	401	526			RS1/10S681J
R	402	423	424 425 426 441 442 527 528 529		RS1/10S681J
R	403	404	405 406 407 408 409 427 428 430		RS1/10S102J
R	410	411	421 433 438 439 440 448 451		RS1/10S473J
R	412	432	518		RS1/10S104J
R	413				RS1/8S472J
R	414				RS1/8S474J
R	415				RS1/8S103J
R	416				RS1/8S473J
R	417	418	419 420		RS1/8S103J

Mark	====	Circuit Symbol & No.	====	Part Name	Part No.
R	422	733	734		RS1/10S223J
R	431				RS1/10S104J
R	434	452	727 728		RS1/10S473J
R	435	443	501 503 514 633 635 729		RS1/10S103J
R	436				RD1/4PS202JL
R	437	450	504 521 531 709 710		RS1/10S102J
R	453	455			RS1/10S473J
R	456				RS1/10S101J
R	502	505	507 515 516 522 525 532 602 618		RS1/10S472J
R	506	613			RD1/4PS103JL
R	508				RS1/10S331J
R	509				RS1/10S182J
R	510	512			RS1/10S101J
R	511				RS1/10S821J
R	513	523	524 612 615 626 631 707 708		RS1/10S473J
R	517	730			RS1/10S222J
R	519				RS1/10S221J
R	520				RS1/10S474J
R	530	711	712 763 764		RS1/10S152J
R	601				RS1/10S103J
R	603	606	614		RD1/4PS102JL
R	604	737	738 739 765		RS1/10S472J
R	605				RD1/4PS472JL
R	616	630	768		RS1/10S472J
R	617				RD1/4PS220JL
R	619				RS1/8S1R0J
R	625				RD1/4PS681JL
R	627	629	632 648 701 702 703 704 731 732		RS1/10S472J
R	628	636			RD1/4PS222JL
R	634				RD1/4PS152JL
R	637				RS1/10S103J
R	638				RD1/4PS272JL
R	643	779	780		RS1/10S0R0J
R	650				RS1/10S183J
R	651	652	653 654		RS1/10S1R0J
R	705	706	782		RS1/10S563J
R	713	714			RS1/10S473J
R	715	716			RS1/10S203J
R	723	724			RS1/10S681J
R	725	726			RS1/10S393J
R	735	736			RS1/10S124J
R	753	754			RS1/10S471J
R	761	762			RS1/10S332J
R	766				RS1/10S393J
R	767				RD1/4PS391JL
R	801	802			RS1/10S431J
R	803	804	805 806		RD1/4PS4R7JL
R	865	866	873 874 877 878 885 886		RS1/10S102J
R	867	868	879 880		RS1/10S562J
R	869	870	881 882		RS1/10S272J
R	871	872	883 884		RS1/10S472J
R	875	876	887 888		RS1/10S473J

## CAPACITORS

Mark	====	Circuit Symbol & No.	====	Part Name	Part No.
C	401				CCSQCH330J50
C	402				CEA2R2M50L2
C	403	503	514 520 731 732		CKSQYB102K50
C	404	409	502 504 515 604		CKSQYB473K25
C	405				CEA100M16LS2

Mark	====	Circuit Symbol & No.	====	Part Name	Part No.
C	406	407 733			CEA010M50LS2
C	408				CKSQYB104K25
C	410				CKSQYB103K50
C	501	507 508 509 511 512 513 518 602			CKSQYB103K50
C	505	510			CCSQCH101J50
C	506				CKSQYB561K50
C	516	517			CCSQCH270J50
C	519		4.7 $\mu$ F/16V		CCH1005
C	601				CKSYB473K25
C	605		2200 $\mu$ F/16V		CCH-123
C	606	607			CEA220M6R3LS
C	608				CEA101M16L2
C	609				CEA101M10L2
C	610				CEA331M16L2
C	611				CEA220M16L2
C	612	710			CEA101M10LS
C	613	614 615 616			CEA470M16L2
C	617				CKSYB104K25
C	701	702 703 704 707 708 709 711 712			CEA4R7M35LS
C	713	714			CCSQCH180J50
C	725	726			CEA4R7M35LS
C	729	730 743			CEHAQ4R7M50
C	734	801			CEHAQ101M10
C	735				CKSQYB104K25
C	736				CEHAS100M16
C	803				CEHAQ470M25
C	804				CEHAS470M16
C	805		4700 $\mu$ F/16V		CCH1068
C	807	808 809 810			COEA224J63
C	863	864 867 868 877 878 879 880			CCSQCH101J50
C	865	866 871 872 875 876 883 884			CEA101M10LS
C	869	870 881 882			CEA100M16LS2
C	874	886			CKSQYB103K50

Tuner Amp Unit		KEH-M650/US KEH-M8200/US KEH-M8250/CA	KEH-M8250/ES
Mark	Circuit Symbol & No.	Part No.	Part No.
	Q632	DTA143EK	.....
	D403, 404	1SS176	.....
	D613	MA151WK-MT	.....
	FM/AM Tuner Unit		
	R427, 428, 430, 450	RS1/10S102J	.....
	R456	RS1/10S101J	.....
	R650	RS1/10S183J	.....
	R703, 704	RS1/10S472J	.....

Unit Number :  
Unit Name : Display Unit

## MISCELLANEOUS

Mark	====	Circuit Symbol & No.	====	Part Name	Part No.
IC	901				LC7582A
IC	902				PD4285
IC	903				BX-1393
IC	904				S-80740AH
Q	901	Chip Transistor			2SC2712

Mark	====	Circuit Symbol & No.	====	Part Name	Part No.
Q	902			Chip Transistor	DTC144EK
D	901 902 903 904 905			Chip Diode	MA143-MC
D	906			Chip Diode	RB717F-3E
L	901			Ferri-Inductor	LAU101K
X	901				CSS1069
SW	1 2 3 4 5 6 7 8			Switch	CSG1044
SW	9 10 11 12 13 14 15 16			Switch	CSG1044
SW	17 18 19			Switch	CSG1044
IL	901 902 908			Lamp 14V 40mA	CEL1025
IL	903 904 909 913			Lamp 14V 40mA	CEL-147
IL	905 906 907			Lamp 115mA 50V	CEL1205
IL	910 911 912			Lamp 115mA 50V	CEL1204
				LCD	CAW1133

## RESISTORS

Mark	====	Circuit Symbol & No.	====	Part Name	Part No.
R	901 902 903 904 905				RS1/8S103J
R	906				RS1/10S223J
R	907				RS1/10S104J
R	908				RS1/10S470J
R	909 910				RS1/10S473J
R	911				RS1/10S103J
R	912 913 914 915 916 917 918 919 920 921				RS1/10S471J
R	922 923				RS1/10S0R0J

## CAPACITORS

Mark	====	Circuit Symbol & No.	====	Part Name	Part No.
C	904				CKSQYB331K50
C	905 907 910				CKSQYB103K50
C	906				CEA470M6R3LS
C	908 909				CCSQCH221J50
C	911 912 913 914 915				CKSQYB152K50

Unit Number :  
Unit Name : Connector P.C. Board

Mark	====	Circuit Symbol & No.	====	Part Name	Part No.
D	1 2				F1SR35-100A
S	1 2 3			Switch (LOAD, END, F/R)	CSN1005

Unit Number :  
Unit Name : Switch P.C. Board

Mark	====	Circuit Symbol & No.	====	Part Name	Part No.
S	1 2			Switch (METAL, PLAY)	CSN1005

## Miscellaneous Parts List

Mark	====	Circuit Symbol & No.	====	Part Name	Part No.
SW	402			Switch (Detach)	CSN1007
HD	1 (KEH-M650/US, KEH-M8250/CA)			Head Unit	EXA1087
HD	1 (KEH-M8200/US, KEH-M8250/ES)			Head Unit	EXA1084
M	1			Motor Unit	EXA1089
SO	1			Solenoid	EXP1009
SO	2			Solenoid	EXP1004